UNIVERSITY MICROFILMS
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EUGENE B. POWER
ANN ARBOR, MICH.
COMP-LRY-11-50

ROADS AND STREETS

HIGHWAYS • STREETS • AIR FIELDS • HEAVY CONSTRUCTION

NOVEMBER 1954

PAVING OHIO TURNPIKE

(Special Report Pages 71-78)

Longest Over-Water Bridge Completed

See Page 4 for Contents

Acceptance Authorized Under Sec. 34.64 P. L. & R.

How **BARBER-GREENE** mounts the wheels of their Model 804 Mixall on Timken tapered roller bearings for long life, minimum maintenance.

New portable Mixall produces up to 5 tons of hot mix per hour...*TIMKEN® bearings keep it rolling*

THE new Barber-Greene 804 Mixall will produce up to 5 tons per hour of any type hot mix, up to 10 tons per hour of cold mix and will produce low slump Portland cement mixes. It's compact and portable, especially suited for small maintenance and paving jobs. Timken® tapered roller bearings on the wheels keep it rolling in all kinds of weather, over all kinds of terrain, assuring availability.

The dirt and mud the Mixall sometimes works in, call for effective closures. By holding housings and axles concentric, Timken bearings make closures more effective. Lubricant is kept in—dirt and moisture are kept out. Result: less time out for maintenance and repair.

Since the Mixall travels almost constantly from job to job, often over rough terrain, the wheel bearings take a beating. But the tapered design of Timken bearings lets them take both radial and thrust loads. And full line contact between rollers and races of Timken bearings provides load-carrying capacity to spare. Shock loads are easily taken because Timken bearings are case-hardened to give them a hard, wear-resistant surface over a tough, shock-resistant core.

If you want rugged dependability in the construction equipment you buy or build, look for the trade-mark "Timken" stamped on every bearing. You get long life with minimum friction. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭

BEARING TAKES RADIAL ◐ AND THRUST ◐ LOADS OR ANY COMBINATION ✳

Your P&H dealer has it!

NOW...
at the industry's lowest price!

Step out in front with
MITI-MITE

Here's why more and more users are buying MITI-MITE — for new ideas — money-saving performance — proved design.

Tops in Quality Construction

It's the simplest, most rugged, most dependable little truck crane ever built — with all the honest-to-goodness quality the P&H name implies! It's easier to operate. And by far the easiest machine of its kind to maintain.

Lowest Price

No other small truck crane gives you so much for so little money. It's loaded with modern features as standard equipment — not extras at additional cost.

Greater Earning Power

For 101 jobs all over the map! P&H's greater stability lets you put "more on the hook" — work faster on any kind of job with less danger of tipping. Greater work capacity means more earning power — more money in your pockets.

It will pay you to buy **now.** Place your order today!

P&H

MITI-MITE

(Model 55)

Fully convertible.
11 cu. ft. capacity as hoe, shovel, etc.
7 tons as a crane.
It's a terrific buy!

P&H TRUCK CRANES

HARNISCHFEGER CORPORATION

Milwaukee 46, Wisconsin

the P&H Line

See your P&H dealer NOW!

"Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H dealer is tops in the business. Get to know him."

Only 2 Field Joints Needed for this 42-ft Sheet Steel Culvert

Three 14-ft sections of 18-in. diameter, galvanized-sheet-steel culvert pipe can be assembled into a 42-ft culvert with only two simple field joints. And it can be done in a few minutes.

Compare this with the number of joints and man-hours required to assemble an equivalent culvert of any other material.

Further, these sections of 18-in. pipe are made of 16-gage sheet, and they weigh about 214 lbs each. This means that they can be unloaded and placed in a trench by two men without the aid of special lifting equipment.

A MORE FLEXIBLE CULVERT PIPE

Pipe made from corrugated steel sheet is strong, flexible and tough, regardless of diameter. It will conform to grade and alignment without pulling apart. It can absorb changing loads caused by shifting or freezing soil.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel meets Federal specifications, as well as those of the American Association of State Highway Officials.

The heavy zinc coating and the copper in Beth-Cu-Loy sheets provide a double defense against rust. Their corrosion-resistance is excellent. Pipes made of this steel can be expected to give many years of trouble-free service.

Any Bethlehem sales office will gladly furnish detailed information.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

ROADS AND STREETS

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 62 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892.

NOVEMBER, 1954 • VOL. 97 • NO. 11

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Construccion Pesada
Mining

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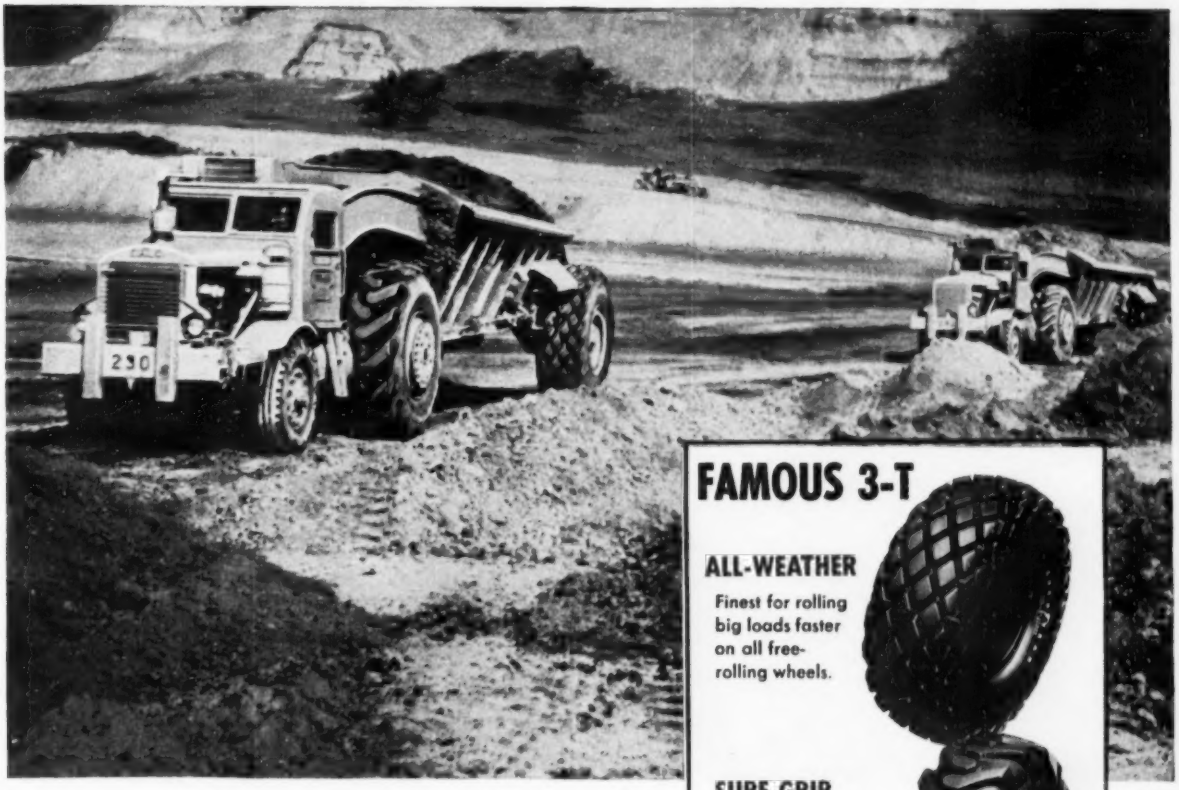
Built to Keep Your Jobs on Schedule



Built with Goodyear's New Triple-Tempered (3-T) Cord!

YOU get the best things first in Goodyear tires — and new, exclusive process Triple-Tempered (3-T) Cord is one of the best tire-cost-per-yard-cutters Goodyear has yet produced!

3-T Cord — either Nylon or Rayon — is vastly stronger, amazingly long-lived. It stays at its most bruise-resistant, heat-resistant point — controls tire growth, cuts tread and body failures to new lows. Combined with the toughest tread stocks yet developed, 3-T Cord makes Goodyear's famous off-road tires tougher, more enduring than ever! Get all the facts before you buy or specify any other tire!

Goodyear, Truck Tire Dept., Akron 16, Ohio

FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

FAMOUS 3-T

ALL-WEATHER

Finest for rolling big loads faster on all free-rolling wheels.

SURE-GRIP

Top tire for traction on any rig where PULL is the prime need.

HARD ROCK RIB

Super-tough champ for front wheels on all tire-killing work.

GET THEM IN 3-T NYLON
for the greatest all-round stamina

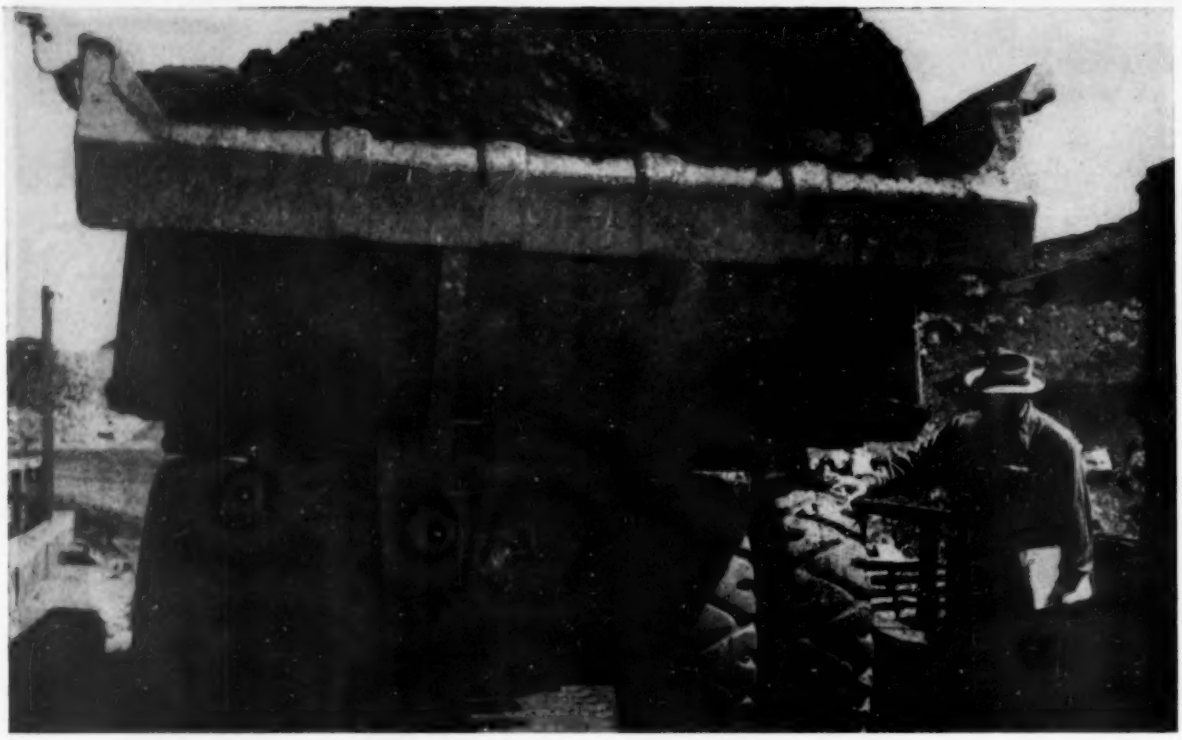
All-Weather, Sure-Grip—
T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE — every other Sunday — NBC TV Network

B.F.Goodrich



Tires roll from pit to plant on rock-strewn roads, defy cuts!

THE roads that connect the mining pits with the Charleson Iron Mining Company's plant at Virginia, Minn., are covered with chunks of abrasive rock and stone. Trucks roll over these roads 24 hours a day, 7 days a week, carrying 17-ton payloads.

Tire mortality could be high. This company uses B. F. Goodrich Universal tires, reports they defy rock cuts.

All-Nylon cord body

They wear longer, too, because Universal tires, size 12.00 and larger, are built with an all-nylon cord body. Nylon is stronger than ordinary cord materials, withstands double the impact, resists heat blowouts and flex breaks.

Under the tread is the B. F. Goodrich nylon shock shield. Layers of strong nylon cords stretch together to absorb and distribute impacts, protect the tire body from shocks and bruises. This means Universal tires wear longer, can be recapped more times. You pay nothing extra for this patented B. F. Goodrich nylon shock shield.

See all-nylon tires today at your B. F. Goodrich retailer's (smaller sizes in all-nylon or rayon construction). The address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

TONS OF ROCK crash onto B. F. Goodrich Universal tires that will carry the load up steep hauling roads to the plant. BFG makes a complete line of off-the-road tires.

CHARLESON'S TIRES are 95% B. F. Goodrich, preferred because the specially-compounded tread defies rock cuts, gives outstanding traction compared to other rock-type tires.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

NEW

in the No. 12

115 HORSEPOWER

A 15% INCREASE IN POWER

NO INCREASE IN PRICE

The new, improved Caterpillar No. 12 Motor Grader features greater power and from-the-seat starting.

NEW

in BOTH No. 12 and No. 112

One-lever from-the-seat starting

Accelerator-decelerator pedals

Improved hand throttle

Redesigned instrument panel in easy-to-read location

No increase in price

Now there's a new high in performance in CAT* Diesel No. 12 and No. 112 Motor Graders. In keeping with Caterpillar's policy of constant product improvement, both these rugged machines incorporate new features that increase their profit-making capacity. The new No. 12 packs more power, 115 HP—and has faster reverse speeds—low reverse, 4 m.p.h.; high reverse, 6.3 m.p.h. For durability, the capacity of the transmission and clutch has been increased to match the greater horsepower. Other improvements, standard in both the No. 12 and No. 112, are: convenient one-lever from-the-seat starting and the accelerator-decelerator pedals that permit changing speeds without changing throttle setting.

With these and other new features, you can figure on even *more* work at lower cost from the No. 12 and No. 112. Along with the No. 212, they are the only motor graders whose major components are built entirely by one manufacturer and serviced by one organization. Their performance record is unmatched—more than 99% ever built are still in use. Ask your nearby Caterpillar Dealer to show you how these machines can step up production and profits for you!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

OVER 15 YEARS OF LOW

TUNE IN...TEXACO
STAR THEATER
starring
DONALD O'CONNOR
or JIMMY DURANTE
on television...
Saturday nights, NBC.

TEXACO

TEXACO

MAINTENANCE COSTS

Reports Isbell Construction Company, Reno, Nevada

"WITH TEXACO MARFAK," reports the Isbell Construction Company, "we've enjoyed over 15 years of low maintenance costs and extra long chassis parts life. Our experience has shown that no matter how tough the terrain, *Texaco Marfak* stays in the bearings and really gives them protection against dirt and moisture."

Contractors everywhere get similar results with *Texaco Marfak*. It won't squeeze or jar out, stays in the bearings, effectively guards against wear and rust. It's top assurance of lower maintenance costs, longer bearing life.

In wheel bearings, use *Texaco Marfak Heavy Duty*. Isbell does and finds that it safeguards bearings for extra thousands of miles between repackings, increases bearing life, assures greater braking safety. No seasonal change required.

More than 500 million pounds of Texaco Marfak have been sold

For crawler tracks, *Texaco Track Roll Lubricant* is ideal. It wards off rust and wear—keeps out dirt and moisture.

Let a Texaco Lubrication Engineer help you step up your equipment efficiency, cut down on maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO SIMPLIFIED LUBRICATION PLAN

With *not more than six* Texaco Lubricants you can handle *all* your major lubrication. The plan saves time and money, reduces lubricant inventories, eliminates lubrication mistakes. Ask a Texaco Lubrication Engineer all about it.

To keep its equipment on the job, and maintenance costs low, Isbell Construction Company—highway builder, open pit mining contractor—has been using Texaco Products for years.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

KOEHRING COMPANY Milwaukee 16, Wis.
Subsidiaries: JOHNSON
PARSONS - KWIK-MIX

BIG-PRODUCTION TEAM — Loading rock, Koehring 1½-yard shovel (above) is teamed up with Koehring Dumpster.®

Measure excavators by

price per pound of lifting capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value.

Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, extra speed and stability to handle bigger loads faster with every excavator attachment.

Check Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

Compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request—ask your Koehring distributor to see them.

KOEHRING HEAVY DUTY

NO TIME FOR DOWNTIME. Until this reservoir is completed, residents of Olathe will be paying premium rates for drinking water. That's why Contractor Lee Yerington says: *"On this dam I need plenty of power with a very minimum of downtime, and that's exactly what I get with my* INTERNATIONALS. *Take that TD-24 pusher, for example. 3500 hours on the meter and it still has original rails and never has had a major overhaul."*

"I needed durability ...my INTERNATIONAL'S delivered"

Contractor solves water shortage for Olathe, Kansas, with fleet of six INTERNATIONAL crawlers that never faltered in building a big dam and 160-acre reservoir

Water exporting business in Kansas City, Missouri, is due for a sharp slump due to the loss of 5,593 cash customers, the residents of Olathe, Kansas.

For many months past the thirsty population of Olathe has been supplementing the city's inadequate water supply by buying water by the tank car from Kansas City, but this condition is being rectified, and in a hurry.

The Yerington Construction Company, Parksville,

A TRAP FOR CEDAR CREEK is shown taking shape as the INTERNATIONAL TD-24 and B-170A scraper begins another loading cycle in the bottom of the new reservoir.

SOME BIG REASONS WHY earthmoving on this 450,000-cubic yard project moved at such a lively pace are apparent in this photograph: TD-24 speed that hauls heaped loads to the dam site at fastest traveling speeds. The positive rolling ejection feature of the INTERNATIONAL B-170A scraper spreads faster and completely cleans the bowl in the process.

Missouri, started construction of a new dam and 160 acre reservoir 2½ miles west of Olathe, and early in 1955 the city expects to be out of the water importing business.

Lee Dell Yerington is using a total of 21 pieces of equipment including 6 INTERNATIONAL tractors and scrapers to move 450,000 cubic yards of dirt and 60,000 cubic yards of rock on this hurry-up project, and here's what he says about his earthmovers:

"I like my INTERNATIONAL *equipment better than any other I have on this job—and for several reasons. I need plenty of power and plenty of durability and my IH crawlers deliver."*

Discover for yourself what this contractor has learned about how INTERNATIONAL crawlers and equipment deliver outstanding power and performance when the chips are down. Just call your INTERNATIONAL Industrial Power Distributor for your demonstration today. He'll bring the IH equipment you need to your job site anytime so you can get the lowdown on the IH rigs that mean more profitable business for you from here on in.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

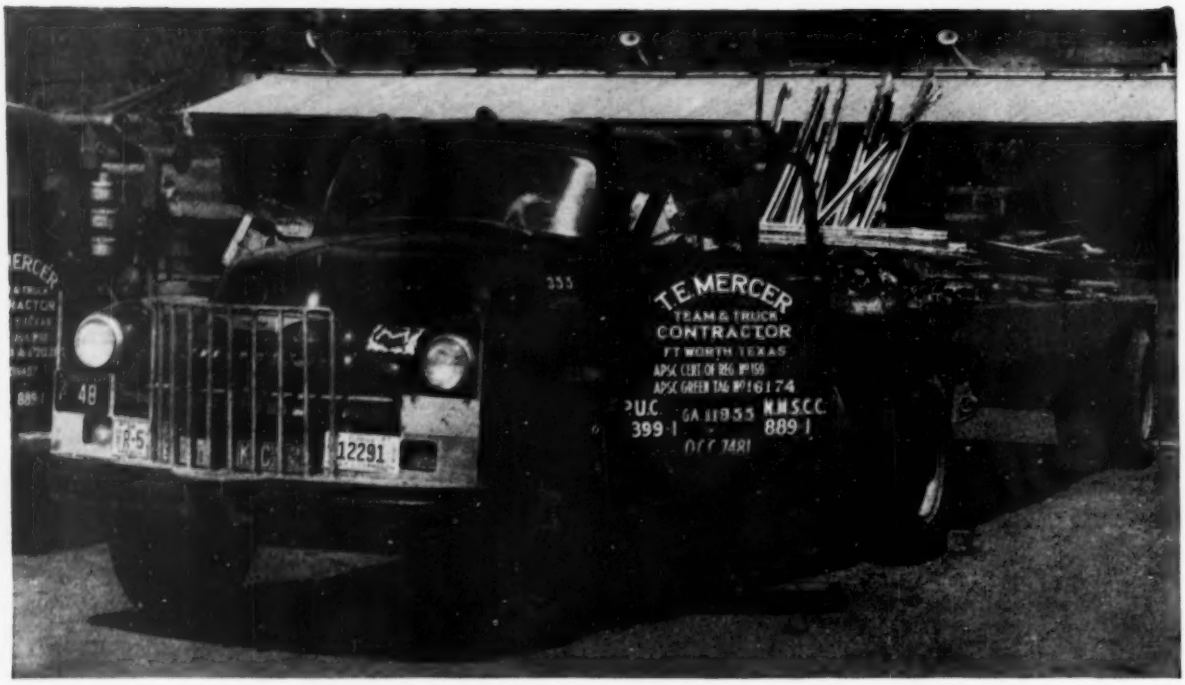
ONE OF FOUR TD-18As the contractor used to hold a 7,000-cubic yard daily production average on this job is shown dozing dirt for a small temporary reservoir. This structure will be used in conjunction with the small natural lake as a reservoir until the new reservoir is completed.

UPGRADE WITH A HEAPED LOAD presents no problem for the Yerington's TD-24 with matched B-170A scraper hauling a solidly packed payload of 21 cubic yards.

INTERNATIONAL HARVESTER

INTERNATIONAL

FOR EVERY MOVE IN EARTHMOVING



NEW CHEVROLET TRUCKS

have what it takes to boost efficiency and bring down costs!

In the next three paragraphs you'll find a few good reasons why you can get more work out of a Chevrolet truck and save money doing it.

INCREASED POWER IS THE FIRST BIG REASON

With Chevrolet's higher compression ratio you've got more power under the hood. Power that results in greater acceleration and hill-climbing ability. Faster starts and acceleration over the day's work save valuable time and increase over-all efficiency. Check the gas mileage, too. With this higher compression ratio, your Chevrolet truck registers *more miles on the job* for each tankful of gas. That's where you start to save money.

BUILT-IN RUGGEDNESS SAVES EVEN MORE

The strength and stamina of more rigid frames, and the special chassis features that pertain to each model—these combine to add extra ruggedness to your Chevrolet truck. Push it hard on the rough jobs; keep it going over long schedules—you'll still find your upkeep costs lower and your Chevrolet trucks lasting a lot longer.

ONE LAST POINT—and maybe the most important to you—you'll find Chevrolet's line of trucks priced the lowest of all! Talk over your needs with your Chevrolet dealer. He'll be glad to give you the facts about the best model for your job. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

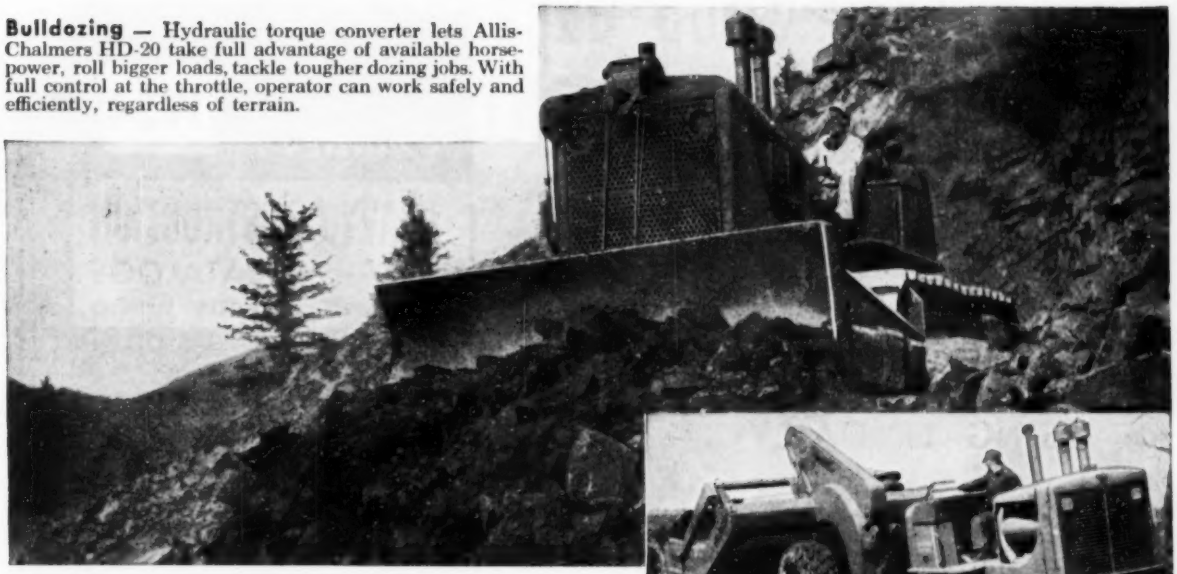
MOST TRUSTWORTHY TRUCKS ON ANY JOB! CHEVROLET

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates backrubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

Bulldozing — Hydraulic torque converter lets Allis-Chalmers HD-20 take full advantage of available horsepower, roll bigger loads, tackle tougher dozing jobs. With full control at the throttle, operator can work safely and efficiently, regardless of terrain.



AN ALLIS-CHALMERS REPORT

How hydraulic torque converter drive improves big tractor performance—increases job output

Allis-Chalmers offers the only crawler tractors that are capable of exerting maximum drawbar pull *at all times* . . . under all load and terrain conditions . . . without gear-shift guesswork.

Whatever the job, the operator need merely make contact with the load and then open the throttle. As the load requirements change, the hydraulic torque converter *automatically* matches the conditions with exactly the right combination of speed and pull.

This eliminates most shifting . . . leads to far more work done in a continuous work cycle . . . far longer equipment life.

• • •

Hydraulic torque converter drive is just one of many reasons why the Allis-Chalmers HD-20 and HD-15 assure you higher output, less upkeep.

HD-20 — WEIGHT — 41,000 LB • 175 NET HP AT FLYWHEEL
HD-15 — WEIGHT — 28,000 LB • 135 NET HP AT FLYWHEEL

Pulling — Hydraulic torque converter drive actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly . . . and automatically accelerates to the highest speed that conditions permit, in either high or low range.

Pushing — Operator just makes contact, then opens the throttle and relaxes. The HD-20 automatically matches speed to that of pushed equipment, maintains steady contact while loading, sends load off to the fill at higher speed.

Digging and Loading — With the HD-20G, the operator crowds surely and steadily, using only throttle and bucket levers. With full horsepower always available even at creeping speed, he can work effectively in mud, on hillsides or edges of banks.

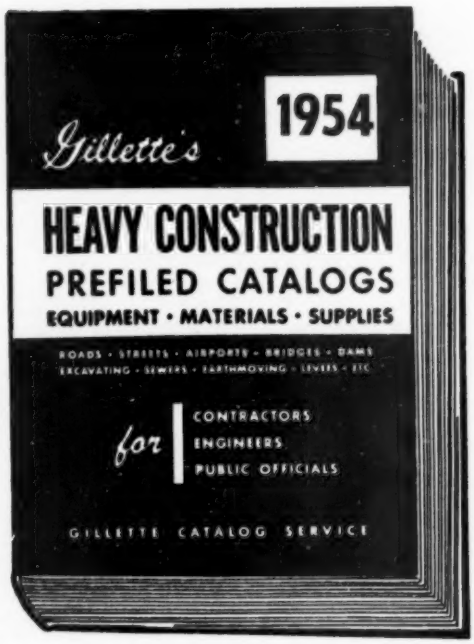
ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

here . . . without a doubt . . . is the most useful buying catalog in your office

. . . and here are some reasons why you should be USING IT DAILY!

- Catalogs are PREFILED — saving you time and space required to file individual manufacturers' catalogs.
- Saves you the time and inconvenience of writing to manufacturers for catalogs.
- Gives you all the facts needed BEFORE you make a buying decision.
- Manufacturers' names and trade names indexed alphabetically for quick reference to individual catalogs.
- All the buying information is 'boiled down' — designed for your convenience.

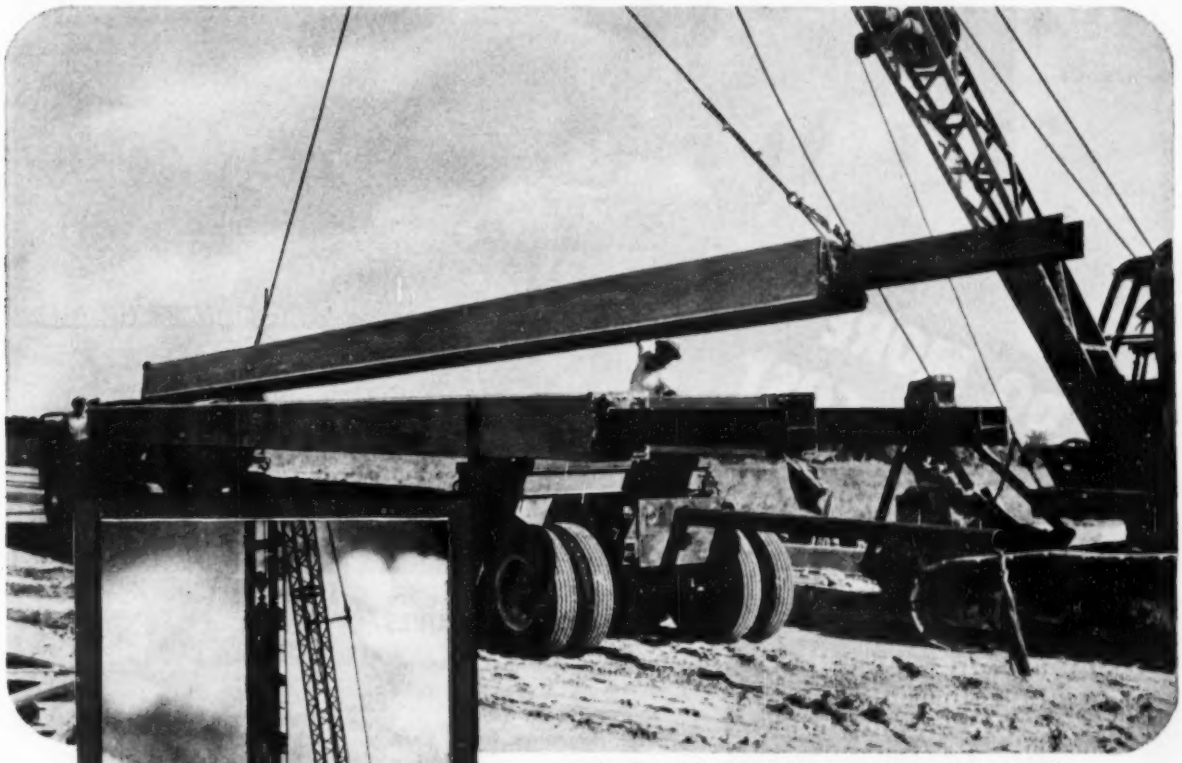
After checking the advantages listed above, you can see why this ONE CATALOG offers you so MANY advantages . . . saving you both time and money, not only in the mechanical and physical aspects of a cataloging operation . . . BUT MOST IMPORTANT OF ALL . . . it is available WHEN you NEED it . . . BEFORE you make your buying decisions! The manufacturers represented in this catalog are literally 'meeting' with you in your office — offering you all the information you could possibly need concerning their products. Why not meet them at least half way — and USE THEIR PREFILED INFORMATION!



Here are the manufacturers represented in Gillette's Heavy Construction Prefiled Catalog:

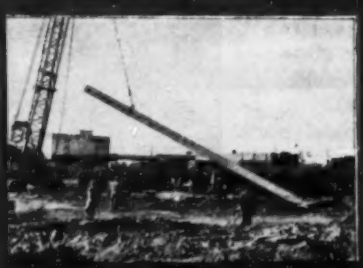
Allis-Chalmers
All Purpose Spreader Company
American Air Filter Company, Inc.
American Bosch Corporation
American Brake Shoe Co.
American-Coleman Co., The
American Manganese Steel Division
American-Marietta Company
American Steel & Wire
American Tractor Equipment Corp.
Anthony Company
Armco Drainage & Metal Products, Inc.
Austin-Western Company
Badger Machine Co.
Baldwin-Lima-Hamilton Corporation
Baker-Lull Corp., The
Ballard Inc., C. L.
Barber-Greene
Bicknell Manufacturing Company
Briscoe & Son, E. V.
Bros Boiler & Mfg. Company, Wm.
Buda Company, The
Buffalo-Springfield
Butler Bin Company
Carey Manufacturing Company, The Philip
Chausse Mfg. Company, Inc.
Chrysler Industrial and Marine Engine Corporation
Clark Equipment Company
Cleaver-Brooks Company
Cleveland Trencher Co., The
Clyde Iron Works, Inc.
Concrete Surfacing Machinery Co., The
Continental Motors Corporation
Cummer & Son Company, The F. D.
Cummins Engine Company, Inc.
Dann Diesel Corporation
Detroit Diesel Engine Division
Dorsey Trailers
Electric Tamper & Equipment Co.
Erie Steel Construction Company
Felker Manufacturing Co.
Fiske Brothers Refining Co.
Flexible Road Joint Machine Company, The
Flintkote Company, The
Galion Iron Works & Mfg. Company, The
Gar-Bro Manufacturing Co.
Gar Wood Industries, Inc.
General Excavator Co.
General Motors
Gledhill Road Machinery Company, The
Goodall Rubber Company
Greenville Steel Car Co.
H & L Tooth Co.
Harnischfeger Corporation
Heil Co., The
Heltzel Steel Form & Iron Company, The
Hercules Motors Corporation
Herman Nelson Division
Hough Co., The Frank G.
Ingersoll-Rand
International Vibration Company, The
Jackson Vibrators, Inc.
Jones & Laughlin Steel Corporation
Joy Manufacturing Company
Kalolight Corporation
Keystone Asphalt Products Company
Kiesler Co., Joe E.
La Crosse Trailer Corporation
Laughlin Co., The Thomas
Le Roi Company
Littleford Bros., Inc.
Lubriplate Division
Madsen Iron Works, Inc.
Marlow Pumps
Minneapolis-Moline
Motter Printing Press Co., John C.
Naugatuck Chemical Division
Noble Company
OK Machinery Division
Omaha Standard
Osgood-General
Owen Bucket Co., The
Pacific Car and Foundry Company
Pioneer Engineering Works, Inc.
Poor & Company
Porter, Inc., H. K.
Prahy Company
Republic Steel Corporation
Rogers Brothers Corporation
St. Paul Hydraulic Hoist
Seaman Motors, Inc.
Servicised Products Corporation
Shunk Manufacturing Company
Sterling Engineering & Manufacturing Co.
Stow Manufacturing Company
Sumner Equipment Limited
Symons Clamp & Manufacturing Company
Tarrant Mfg. Co.
Tilden Tool Mfg. Co.
Timken Roller Bearing Company, The
Toncan Culvert
Transport Trailers, Inc.
United States Motors Corporation
United States Rubber Co.
United States Steel
Wellman Engineering Company, The
Winpower Manufacturing Co.
Wix Corporation
Wyoming Valley Equipment Co., Inc.
York Modern Corporation

NOW—PRESTRESSED CONCRETE PILES OPEN ANOTHER BIG MARKET



Loading three of the 20" x 20" composite prestressed concrete and steel test piles cast for the new Gandy Bridge by Florida Prestressed Concrete Co., Inc., Tampa, Florida.

Driving a 50-foot precast, pre-tensioned pile, designed by Lakeland Engineering Associates of Lakeland, Florida and produced by R. H. Wright & Son, Fort Lauderdale, Florida.



Handling a precast, pre-tensioned pile with one point pick-up — proving the pile's extreme strength. If a reinforced concrete pile were lifted in this manner it would buckle from its own weight.

ONE OF THE NEWEST DEVELOPMENTS in the precast, pre-tensioned concrete field is piling. Such piling has already been used for several bridges, and is now under consideration or contract for several more. Illustrated above, for instance, are composite test piles designed for the new Gandy Bridge* which will form another connection between Tampa and St. Petersburg, Florida. 30 feet long by 20 inches square, these piles have a 10-inch sonovoid hollow, and a steel H beam bottom tip extending into and beyond the end of the pile. The steel tip is sometimes added to pierce the rock strata peculiar to some areas of Florida.

The tensioning elements employed are Roebling 3/8 inch diameter, 7-wire stress-relieved Prestressed Concrete Strands, and the initial prestressing force is 151 tons.

Roebling engineers, who have led in the development of prestressing techniques and tensioning elements in America, are always ready to cooperate with you to help assure top results on any specific prestressed concrete application. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

*Designed by the Bridge Division of the State Road Department of Florida.

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Subsidiary of The Colorado Fuel and Iron Corporation

DO MORE at LESS COST

—with the GALION 503 GRADER

HYD. SHIFTABLE MOLDBOARD

Economy and versatility are important features of this GALION "handy man" Motor Grader. With its many-use attachments it is easily the busiest piece of equipment in highway and street departments all over the country. The GALION 503 does most operations with "big grader" efficiency at less than half the cost. Write for literature.

STANDARD FEATURES

- Positive, 4-wheel tandem drive.
- Hydraulic controls.
- High-clearance front axle.
- Gasoline engine — 50 h.p.
- Four forward speeds, 2.3 to 20.4 m.p.h.; reverse 3.38 m.p.h.

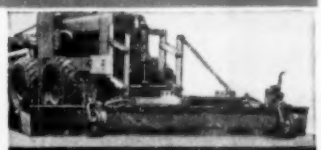
  Front tires 6.00-20, rear tires 7.50-20; larger sizes available.

"EXTRA" FEATURES

- Attachments as illustrated.

ALSO

- Hydraulic circle reverse.
- Leaning front wheels.
- Stand-up height steel cab with full-view safety glass.
- Front-positioned hydraulic scarifier.
- Diesel engine available.



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ROADS AND STREETS

Washington News Letter

November 8, 1954

By Duane L. Cronk

Creation of a federal agency empowered to make loans to the states or to guarantee state bond issues may be recommended by the Clay Committee as a way to finance President Eisenhower's proposed $50-billion highway construction program.

The idea was supported at the recent two-day hearings in Washington by representatives of a number of highway interests, including the American Association of State Highway Officials, the American Road Builders Association, the American Municipal Association, American Trucking Associations, and the National Association of Motor Bus Operators.

General Lucius Clay told reporters at the close of the session that some use of federal credit might prove the key to providing funds for a road building program more than twice as large as the one currently under way.

* * *

The ARBA spelled out the theory in its testimony before the committee: "Ways and means must be found for supplementing federal grants with the utilization of federal credit. Many devices can undoubtedly be set up for the extension of such credit, but it appears rather fundamental that the first step would be the creation of a federal highway financing agency strongly capitalized and fully empowered to issue tax exempt securities for the purpose of raising revenues to assist in the financing of highway improvements at state and other local levels.

"Such financial assistance could be in the form of loans, the purchase of local securities, the guarantee of such securities, or any combination thereof."

A committee of state highway officials has recommended to the President that consideration be given to borrowings which could be backed by the federal 2¢ gasoline tax, A. E. Johnson, president of the AASHO, testified.

Speaking for municipal officials, Mayor A. E. Cobo of Detroit strongly urged that the federal government not only guarantee state bond issues for road construction but do some borrowing itself to increase federal aid to the states. Uncle Sam should, he said:

- Permit states to issue 25-year revenue bonds, backed by guaranteed federal-aid appropriations.
- Set up a financing authority and borrow money to pay its share of project construction costs.

(continued on next page)

"We have $600 million to $1 billion worth of work we could tackle in Detroit if the federal government would guarantee our bond issues," Mayor Cobo declared.

* * *

Another major recommendation made to the committee was that the federal government begin to finance entirely future construction on the 40,000 mile interstate system.

State highway officials, truckers, and road builders presented a solid front in asking that as much as 100% of the cost of strengthening the interstate systems be borne by the federal government. There is growing belief in Washington that such a move is only a matter of time and politics. Heretofore, such construction has been financed on a matching basis with the states.

* * *

Almost overshadowed by other developments before the Clay committee was the announcement that the nation's road needs during the next 10 years will hit $101 billion. General Clay reported the figure as a reliable projection of estimates now being analyzed by the Bureau of Public Roads, and used it to emphasize the urgency of the problem.

The figure was immediately attacked by several witnesses, who pointed out that the bureau's estimate four months ago was $45 billion to $50 billion - actually a 1949 estimate. But the BPR stood by its latest estimate, claiming that the new figure is the result of the first comprehensive survey and had been tremendously boosted by:

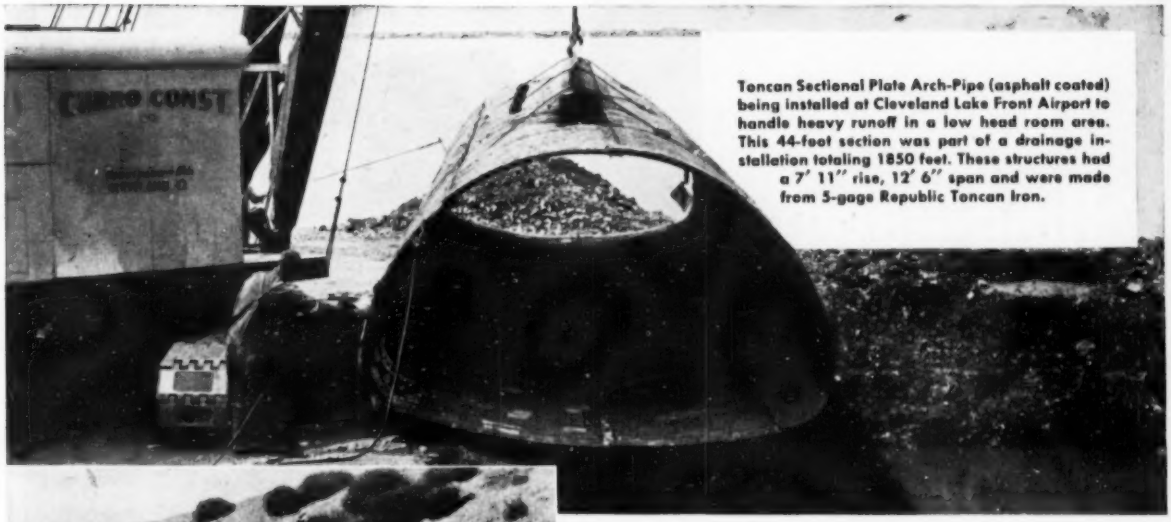
- Including street, as well as highway needs.
- Evaluation of needs on the interstate system on the basis of higher standards of construction and including the high cost of relocating 90% of the super system to meet limited-access standards.

Capacity of contractors to handle a $101-billion program over a 10-year period was quickly submitted by the Associated General Contractors of America to be adequate. The AGC pointed to a BPR report that low bids this year have been more than 10% below engineers' estimates and that the average number of bidders per job was seven during the first half of '54.

The AASHO also testified that state highway departments were banking on contractors' ability to handle the big program and believed there would be "sufficient competition to insure favorable prices."

The shortage of engineers and the lack of provisions for acquiring right-of-way were frankly foreseen by other highway witnesses as prime bottlenecks.

* * *



Toncan Sectional Plate Arch-Pipe (asphalt coated) being installed at Cleveland Lake Front Airport to handle heavy runoff in a low head room area. This 44-foot section was part of a drainage installation totaling 1850 feet. These structures had a 7′ 11″ rise, 12′ 6″ span and were made from 5-gage Republic Toncan Iron.

Toncan Corrugated Metal Pipe was used under heavy railroad fill near Shamrock, Texas. Fill was 45 feet. These 72-inch-diameter pipes were fabricated from 8-gage Republic Toncan Iron.

Triple Type "C" Toncan Sectional Plate Arch was installed to carry a stream under a runway at the Niagara Falls Air Force Base. Each arch is 270 feet long with 14-foot span, 6′ 5¼″-rise, with both ends sloped 1 on 2. 3-gage Republic Toncan Iron was used. Type "C" refers to method of fastening arch to abutment with angle irons.

Fast, low cost installations that last for years with TONCAN DRAINAGE PRODUCTS

Toncan Drainage Structures are easily installed in any weather with unskilled labor. Lightweight, preformed sections reduce shipping, handling and installation costs. A single order covers all needed materials.

And you never need to worry about Toncan Drainage Structures. They are unaffected by impact, vibration, shifting soils or severe weather changes. These low cost drainage structures are available in Republic Copper Steel, or in Republic Toncan Iron with the highest rust-resistance of any ferrous metal in its price class.

Contact one of the Toncan Drainage Products manufacturers listed below for "specs" and engineering data. Or write:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Toncan Drainage Products are made from Republic Toncan Iron and Republic Copper Steel

Corrugated Metal Pipe • Perforated Corrugated Metal Pipe • Sectional Plate Pipe • Sectional Plate Arches • Corrugated Metal Arch-Pipe • Sectional Plate Arch-Pipe • CorWel Subdrainage Pipe • Asphalt Coated Pipe • Asphalt Coated and Paved Pipe.

Manufacturers of Toncan Drainage Products

BEALL PIPE & TANK CORPORATION
PORTLAND, ORE.
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BERGER METAL CULVERT CO., INC.
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THE BOARDMAN CO.
OKLAHOMA CITY, OKLA.
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BLUEGRASS PIPE & CULVERT CO.
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ALEXANDRIA, LA.

CHOCTAW, INC.
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DOMINION CULVERT & METAL CORP.
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EATON METAL PRODUCTS CORP.
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EATON METAL PRODUCTS COMPANY
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EMPIRE STATE CULVERT CORP.
GROTON, N. Y.

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UTAH CULVERT COMPANY
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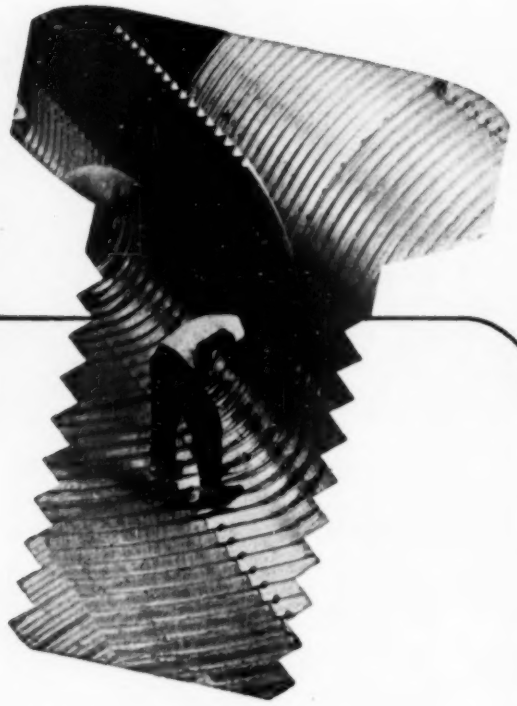
MADISON, WIS.

WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

These Bolts Hold Down Drainage Costs



Simple bolted assembly means quick, low-cost installation of Armco Corrugated Metal Drainage Structures.

The long bolt tightens simple coupling bands to join 20-foot sections of Standard Corrugated Pipe or Pipe-Arch. The short bolt is used to assemble Armco MULTI-PLATE Structures from pre-curved corrugated sections. No special equipment is needed and a small crew can make an installation in a few hours without previous experience. Traffic can move across the structure as soon as backfill is completed.

There is a size and type of Armco Drainage Structure to meet almost every drainage need. Standard, round corrugated metal pipe is ideal for smaller culverts; where headroom is limited Armco Pipe-Arch provides efficient drainage; and Armco MULTI-PLATE Pipe and Pipe-Arch extend the advantages of corrugated metal design into the larger sizes. Ample strength and material durability assure years of maintenance-free service. For complete information, write Armco Drainage & Metal Products, Inc., 1134 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Drainage Structures ARMCO

"nothing else comes close to it"

PAYLOADER tractor-shovel does many jobs on 7 million dollar building contract

VERNON C. NEAL, INC. of Pittsburgh, Pa. has over 7 million dollars of contracts in Columbus, Ohio involving 73 apartment houses and a large school. Speaking of their Model HM 4-wheel-drive "PAYLOADER" Supt. Allen says, "It is one machine that is paying for itself. We just work h . . . out of it. Nothing else can come close to it."

Pouring concrete into wall forms, as shown, the machine places 40 yards a day. Using a 20 foot boom, it also hoists concrete blocks to second-story construction. These are two of its special jobs in addition to its many applications with standard bucket. In use for over a year, it has had no "down time".

Whether you're a contractor or a public works official, a "PAYLOADER" tractor-shovel can help you solve more earth-moving and material-handling problems than you can imagine. They've proven it in thousands of cases — they're proven by millions of hours of accumulated work time.

There's a size and model of "PAYLOADER" to fit *your* needs . . . bucket capacities from 12 cu. ft. to 2 cu. yd. — 4-wheel-drive types . . . front-wheel and rear-wheel drive types. Your Hough Distributor will be glad to demonstrate — see him today or write The Frank G. Hough Co., 768 Sunnyside Ave., Libertyville, Illinois.

PAYLOADER®

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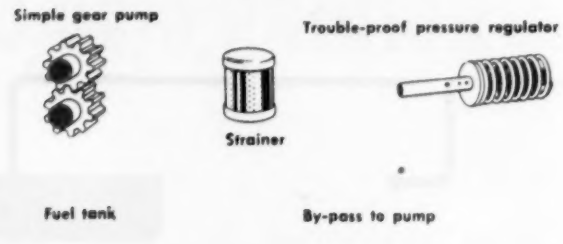
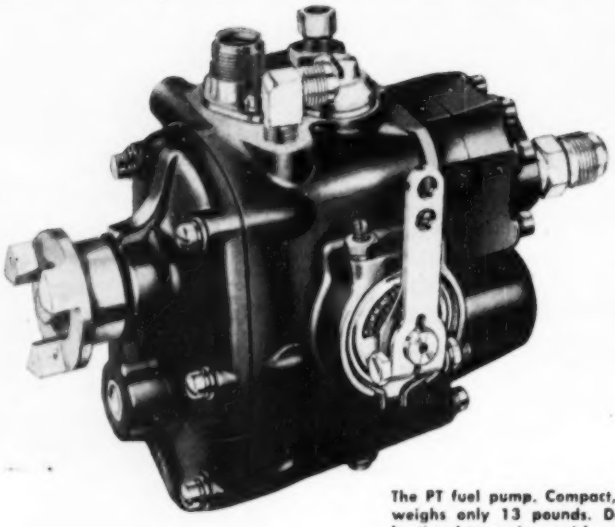
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Here's the simplest diesel fuel system ever developed!

Simplest pump and fuel control arrangement



Cummins new PT *fuel system...*

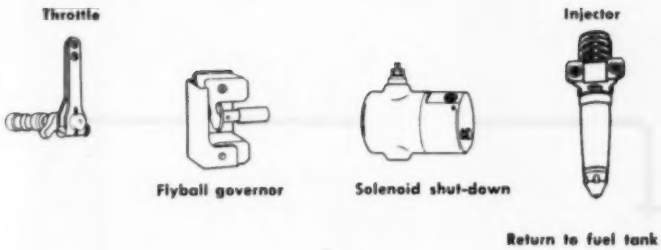


The PT fuel pump. Compact, easy to handle, weighs only 13 pounds. Does not have to be timed to engine, quick and easy to install.

The PT injector utilizes the exclusive Cummins principle of fuel injection which has set the highest standards of performance and economy for more than 20 years.

THE revolutionary new PT fuel system, now standard on all Cummins Diesels, has fewer and far simpler parts than carburetor and ignition systems or ordinary diesel fuel systems. It is easy to understand, simple to work with, can be serviced by any mechanic. No longer any need for fuel system specialists! The PT fuel system has undergone two years of field testing and millions of operating miles under every conceivable condition. Its dependability record is phenomenal. Operators report even less fuel consumption than with earlier Cummins fuel systems and far less cost of maintenance. The PT fuel system can be installed on any Cummins Diesel built since 1932.

Cummins *leader in lightweight high speed diesel power 60-600 h.p.*



PT advantages over gasoline systems:

No contact points to adjust	No vapor-lock problems
No condenser to replace	No flooding
No spark coil to short	No choking or priming
No wiring harness to short	No needle valves to clog
No spark plugs	No butterfly valve
	No float level to maintain
	No float valve to stick

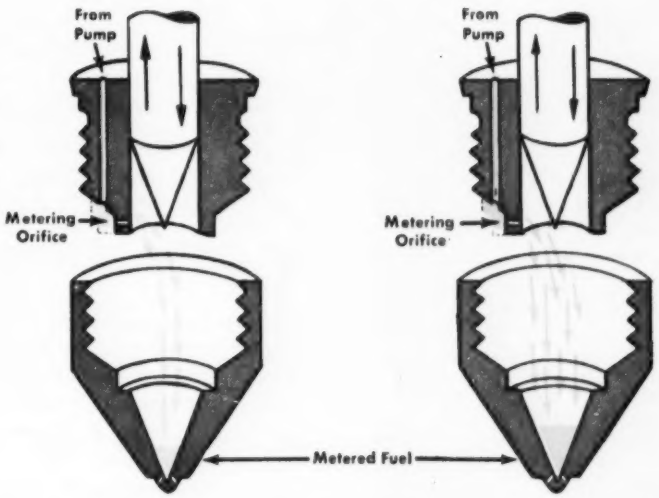
PT advantages over ordinary diesel systems:

No fuel rack adjustments	No distributor discs
No check valves	No metering pumps
No needle valves	No high-pressure fuel lines
No helixes	No fuel pump timing

. . . simpler to work with than gasoline carburetion and ignition

Simplest Fuel Metering Device

The principle is simply that the amount of fuel flowing through a fixed orifice varies according to the amount of pressure on the fuel. Pressure is controlled by the throttle on the PT pump. Fuel flow through orifice is cut off as injector plunger, actuated by engine camshaft, moves down to inject fuel.



When engine is under partial load, fuel pressure is low, and only a small amount of fuel passes through orifice into injector cup.

When engine is under full load, fuel pressure is increased, and greater amount of fuel passes through orifice into injector cup.

Mail this today, and get more PT facts!

CUMMINS ENGINE COMPANY, INC., DEPT. RS-11
Columbus, Indiana

Please send me free illustrated folder, "Cummins PT Fuel System."

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TOUGH! Using Rear Steer to angle the bulldozer blade and spill the material over the side of the fill. Impossible with any other grader-bulldozer.

TOUGHER! Rocks and earth are needed to repair this washout. Traction is ample. Powerful drivers hold front end steady.

TOUGHEST! Clearing boulders from the bed of a rushing mountain stream to open a ford around a bridge.

YOU NEED THE POWER AND TRACTION OF AUSTIN-WESTERN'S ALL-WHEEL DRIVE

Good going or bad . . . earth, stumps or rocks . . . this fast, hydraulically operated bulldozer can do work far beyond the range of such an attachment on an ordinary motor grader, thanks to the extra power of All-Wheel Drive and super-maneuverability of exclusive All-Wheel Steer. By swinging the rear end of the grader to right or left, the machine can be used as an angledozer.

The bulldozer blade is of welded steel construction, heavily built and reinforced to handle successfully work of the rough-and-tumble variety pictured on this page, and move maximum amounts of material when the going is easier.

There is constant or intermittent need for a bulldozer on many road construction and heavy maintenance operations. On rugged Austin-Western Power Graders, this attachment eliminates the necessity of tying up extra equipment for the occasional job; is an essential on many jobs and a time and money saver on dozens of others.

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Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

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Construction Equipment Division

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Subsidiary of Baldwin-Lima-Hamilton Corporation
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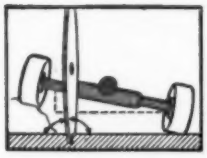
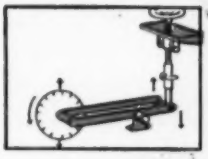
PUT *NEW* PROFIT IN CUTTING CONCRETE!

Use Genuine CLIPPER SAWS — and CLIPPER BLADES
Perfect Combination for Joints — Trenches — Patches



Self-Propelled . . . and powered by 25 Horsepower . . . Clipper's new C-250 "ConSawMatic" cuts the MOST concrete for the LEAST cost per **foot!** Exclusive 3-Point Suspension on rugged 4-wheel chassis eliminates blade binding, reduces wear. Improved Screw Feed for **positive** Depth Control, essential with new **GreenCon** Abrasive Blades. Easy to handle, gets you **"on the line"** fast, ready to cut in a hurry. FREE TRIAL **will show you** why "4 Out Of 5 Buy Clipper"



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World's first—and finest Masonry Saw. Clipper, world's largest manufacturer of Masonry and Concrete Cutting Equipment, sets a new standard for Quality Workmanship and Tested Performance. The name Clipper Guarantees your Satisfaction!

MODEL HD
15 MODELS
Priced from $265

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Savings you never dreamed of—as high as 80% with Clipper's new "GreenCon" Blades. Reinforced Abrasive Blades that knife through green concrete with limestone aggregate. Call or write Clipper today!

NEW Diamond Blades by Clipper—cut ANY concrete. There's new ease and speed in Clipper's **improved blade specifications**... for cutting green, cured or aged concrete. A blade for any job—any aggregate—every saw!

Clipper PRODUCTS

SIMPLE in operation
RUGGED in construction
DEPENDABLE in performance

SAME DAY SERVICE FROM YOUR NEAREST FACTORY BRANCH—

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COAST TO COAST

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- MILWAUKEE
- ST. PAUL
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- DENVER
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PERFORMANCE pays off in EXTRA PAYLOADS!

Picking up a heaped load of about 18 cu. yds. on a section of the Los Angeles Golden State Freeway. Contractor: Kuhn & Murphy.

EUCLID SCRAPERS have proved their high job availability and productive capacity on all kinds and sizes of jobs. They are the fastest growing scraper line in the industry and an important part of the profit picture for many leading contractors ... large and small.

Before you buy any scraper equipment, check with "Euc" owners about actual job performance ... yardage moved per day, and maintenance and operating cost — week by week — not just "paper" figures. You'll find "Euc" Scrapers are real money makers for owners because they get heaped, compacted loads easily, maintain fast travel speeds, dump and spread the load on the run — all adding up to more payloads per hour day after day. Have your Euclid Distributor give you all the facts soon.

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FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

Top Performance on the Toughest Jobs... *Everywhere!*

Dawson-Wade & Co. Ltd. have a tough 22-mile section of the Trans-Canada Highway near Golden, British Columbia. A "Euc" scraper is shown getting a heaped load of approximately 18 cu. yds. from a deep cut on this rough and rugged highway construction job.

One of two "Euc" Scrapers stripping overburden in a Fuller's Earth mine of Floridin Company, Quincy, Florida. This material is hauled 100 to 500 feet to a waste dump, from which it can be returned by the Scrapers to reclaim the land after the Fuller's Earth has been mined.

Amis-San Ore Co. used five "Euc" scrapers, a Loader and fleet of Bottom-Dumps on a 2¼ million yard runway construction and channel relocation job at Lincoln Air Force Base in Nebraska. Here a "Euc" 15.5 yard scraper, working on the channel relocation, is loaded with clay excavation for the 1¼ mile haul.

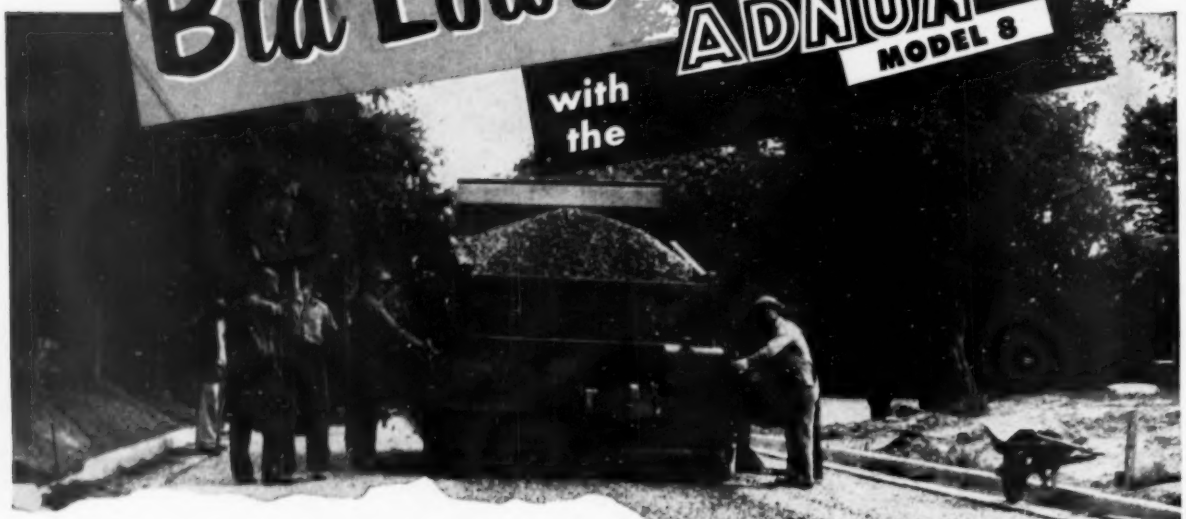
Four "Eucs" made the dirt fly as they averaged 2.6 minutes per round trip on this Ohio Turnpike job for W. T. Cook Const. Co. Although loading in hard, heavy clay, each "Euc" was heaped and away on the 1000 foot haul in less than a minute.

"Euc" scrapers picked up big loads in a hurry on this 12.9 mile section of the Garden State Parkway near Pleasantville, New Jersey for S. J. Groves & Sons, Minneapolis. "Euc" Loader and Bottom-Dumps were also used on this project.

Levelling a new park at Wellington, Dryden Construction Co. used the first "Euc" Twin-Power Scraper in New Zealand. Round trip haul was only 300 yds. but up-grades on the return trip were as much as 40%. The "Twin" spread loads of 24 cu. yds. in a gully and made the cycle in less than 2 minutes.

Contractor preference — *based on high production and low cost per yard moved* — **has made "Euc" Scrapers the fastest growing line in the field**

Bid Lower with the ADNUN JR MODEL 8



THE ADNUN JR. has advantages that permit closer bidding. Its design and construction (far superior to that of any other tow type rig) assures service with the minimum of "down time" and freedom from adjustment.

The easy self-adjusting truck tow hitch cuts hook up time. Engine power takes the unloaded paver to new locations. No time is wasted by the truck. The overlapping Oscillating Cutter Bar compacts material against the parallel course making a tight joint and eliminating raking. Anti-friction bearings throughout and advanced construction mean long life, trouble free operation.

The Adnun Jr. gives you something to sell your customers in its ability to produce a better job. Adnun Continuous Course Correction, Raker Bar action and the overlapping Oscillating Screed mean a smoother surface, fewer hollows in large areas, better density and tighter joints. This all sums up to longer lasting pavement and freedom from patching in the years to come.

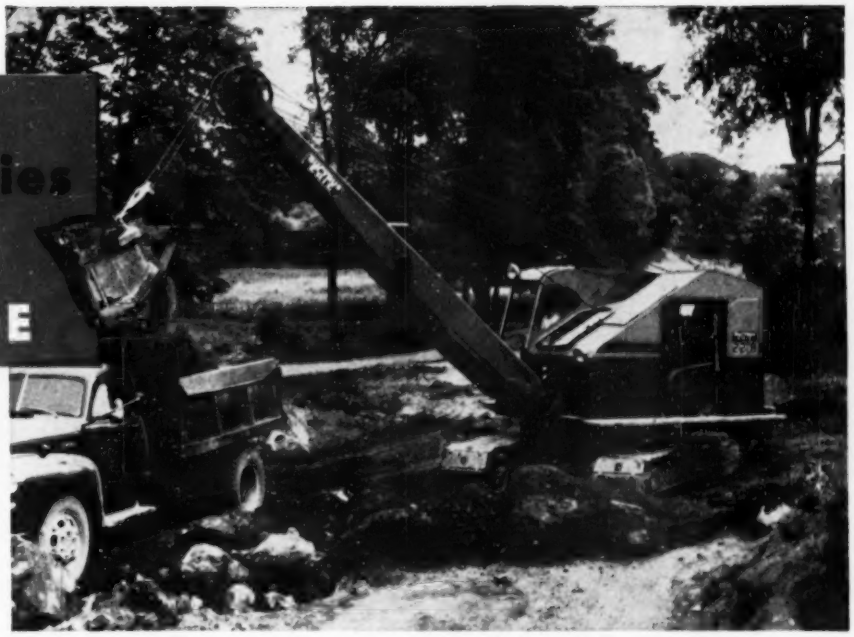
We can't tell the whole story here but if you are bidding on non-specification work you should find out about the Adnun Jr. Let us send you the latest bulletin.

ADNUN JR
MODEL 8
BLACK TOP PAVER

BLAW-KNOX COMPANY
FOOTE CONSTRUCTION EQUIPMENT DIVISION
1936 State Street
Nunda, New York

BLAW-KNOX

How Bucyrus-Eries BOOST YARDAGE THREE WAYS



1. POWERFUL DIGGING ACTION

Bucyrus-Erie excavators give you more useable power at the dipper. Engines are "tailored" to meet the demands of excavator service — there's less pull-down under sudden loads, more lugging power at slow speeds, and they regain speed quickly. There's a minimum loss of power, too, because there are fewer wearing parts and anti-friction bearings are used liberally.

2. RAPID HOIST AND SWING

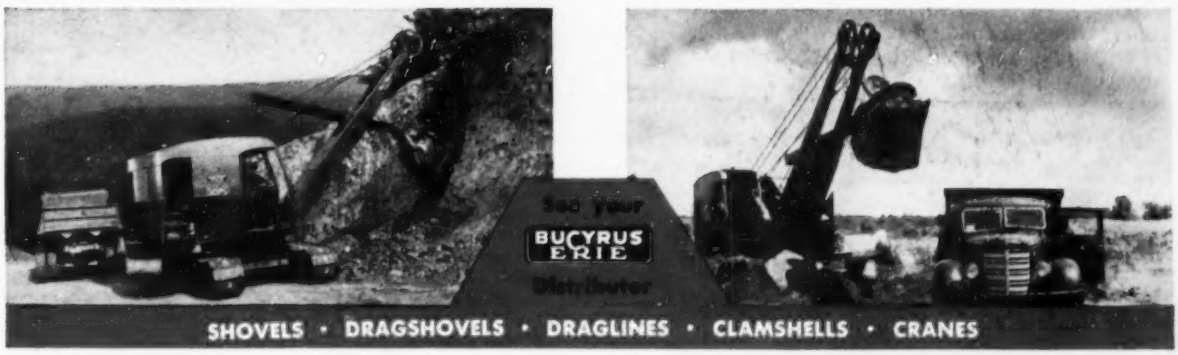
Smooth coordination of all functions in the hoist and swing cycle speeds operation and increases output. Instant-acting controls deliver quick acceleration and deceleration, accurate stops. There's no excess weight to slow operation — you get maximum working ability per pound of weight.

3. LESS DOWNTIME, MORE WORKING TIME

The right combination of power and speed assures you of efficient excavating. Right design and construction throughout means not only sustained high output, but also low operating costs, low repair costs, and long machine life. All are yours with Bucyrus-Erie Individual Design.

With Bucyrus-Erie's unique Individual Design of every model in the line, each component of a particular machine is matched to the job it must handle. You get an excavator that's built *right* from boom point to treads. See your Bucyrus-Erie distributor soon for the complete story. 50E54C

BUCYRUS-ERIE COMPANY South Milwaukee, Wisconsin



We tie truck axles in

in the new Timken-Detroit indoor proving ground

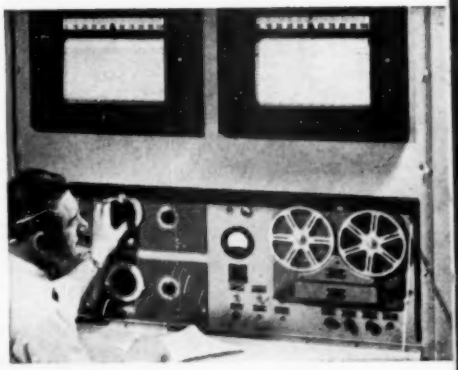
. . . and only Timken has it!

We smash, twist, jerk and over-load them. Match every imaginable hauling situation. Then add a few ruinous tricks of our own.

It's done on purpose. So we can tell you in advance that a Timken-Detroit axle can take a more brutal beating on the job it was designed for than any other axle made.

To prove it, we condensed a multi-thousand acre proving ground into one room. In it, our engineers can apply 50 years of experience in building axles for trucks, buses and trailers. Here axles and gearing are subjected *indoors* to any possible *outdoor* hauling condition. Axle performance is measured and analyzed under absolute scientific control!

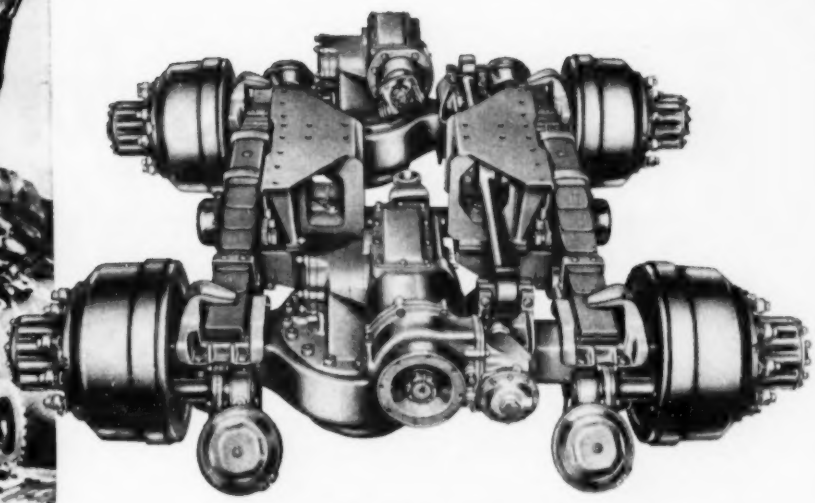
As a result: you enjoy longer axle life; less maintenance, repairs and down-time; lower operating costs; fatter profits. No wonder Timken-Detroit axles are the choice of manufacturers and owners everywhere!



This is our "truck driver." He works in our "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!

How TDA proves axle quality in this "Torture Chamber"

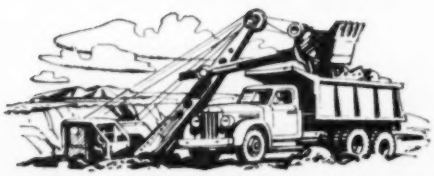
We pick one of our axles at random . . . then duplicate a hauling condition, hour after hour, day after day . . . simulating half a million miles of the toughest driving situations in just a few days. Or "invent" a test like going uphill with a full load from California to New York non-stop. There is no other axle testing like it in the world!



THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.

Soft ground? Heavy load—all up-grade? That's a tremendous strain on an axle. But it's nothing compared to what we do in the indoor proving ground! For instance—we take an axle shaft and twist it 14° forward and backward, 36 times a minute, 24 hours a day, week after week. And that's only one test to give you low-cost performance, long axle life regardless of your hauling conditions.

knots



TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted D A Standard

TRADE MARK REGISTERED

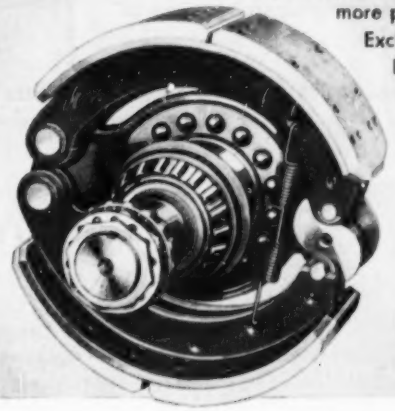
"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

For six-wheelers . . . the TDA Tandem Drive Rear Axle Unit

Now—the *world's finest* tandem drive rear axle unit for heavy-duty motor trucks! And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speeds servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings...eliminate metal-to-metal contact. Require no lubrication.

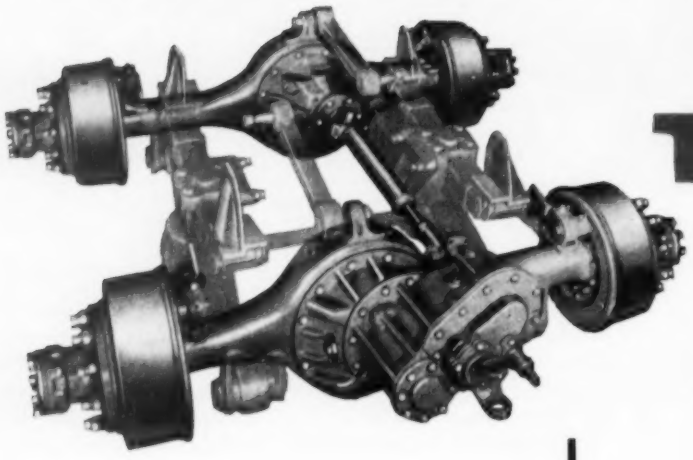
New TDA brake shoes save up to 40 lbs. per axle



• Lightweight, pressed steel construction to give you more payload plus long wear and safety. Exclusive ¾" TDA "Econoliner" brake liners held rigidly by 12 deep-set rivets per block—*not bolts*. Liners are thickest at center where greatest wear occurs—taper down at ends. Result—longer wear, greater stopping ability. New cam roller mountings never seize or brinnel. Light nylon camshaft bearings wear up to 4 times as long! It's America's new brake shoe!

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

SIX reasons for the superior performance of EATON TANDEM DRIVE AXLES



1 Designed Specifically for Tandem Operation,
Eaton Tandem Axles are not subject to abnormal stresses or complicated lubrication problems.

2 Single Drive Line
on a normal angle gives a direct lead from power divider to rear axle; simplifies design, eliminates excess parts, minimizes maintenance.

3 Rugged Power Divider
mounted on forward axle, is of simple design; provides for transmission of power equally to both axles.

4 Inter-Axle Differential
in power divider assures equalized power transmission even though wheel speed may vary due to road irregularities or tire diameter variations.

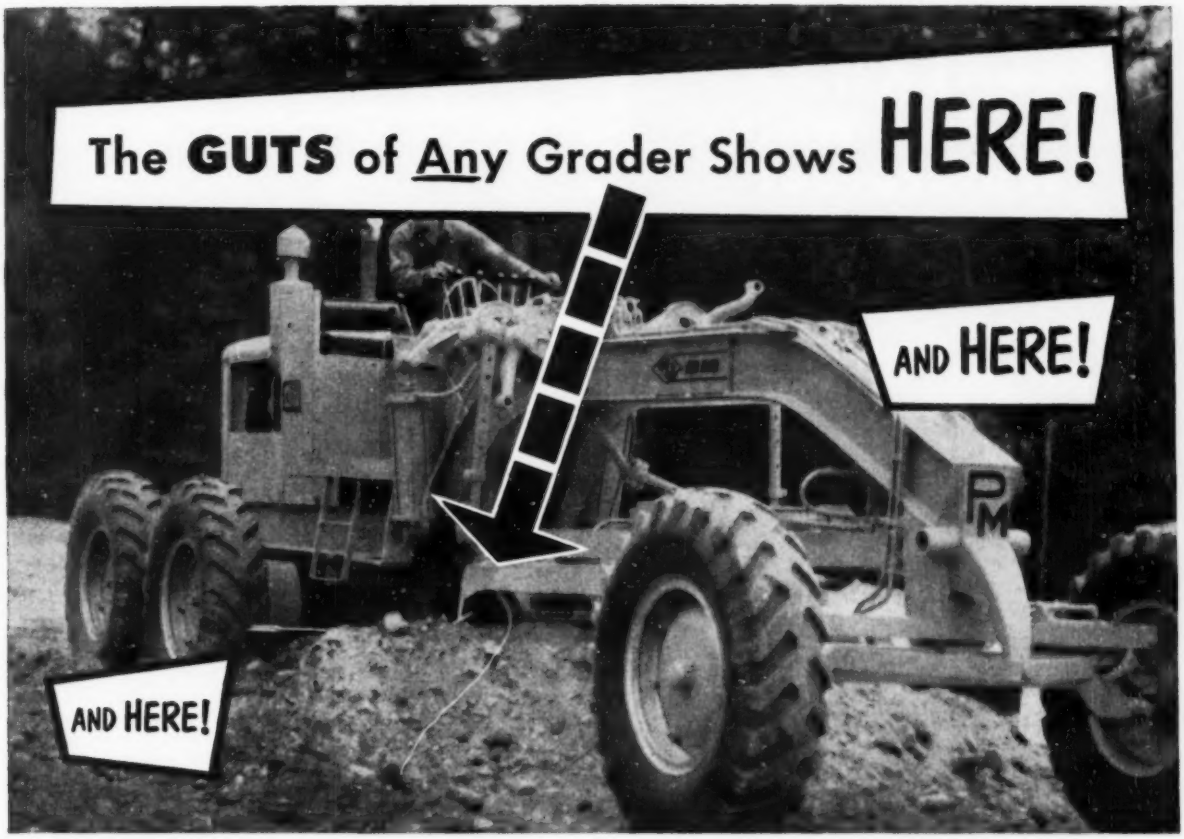
5 Differential Lock-out
between forward and rear axles (optional on some models) provides positive drive to each of the axles, when required because of soft or slippery road conditions.

6 Maximum Strength with Minimum Weight
is achieved through simplified design, experienced engineering, and accurate fabrication.

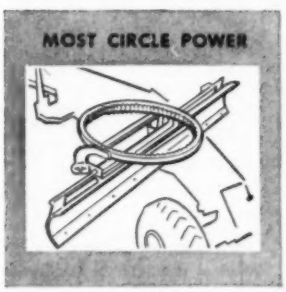
Ask your truck dealer to explain how Eaton Tandem Drive Axles provide trucks with greater load capacity — reduce tire and operating costs.

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



All the Fancy Talk About the Gimmicks Can't Deny that POWER Must Always Be the FIRST Consideration

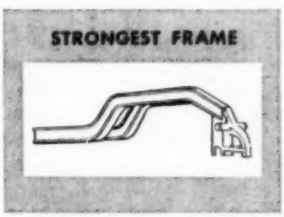


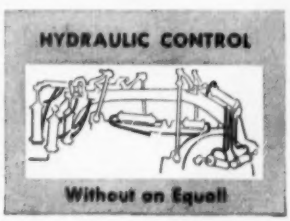
The thing that pays off in grading is POWER . . . put out as the Pettibone Speed Grader delivers it! Owner after owner is demonstrating this every day . . . moving full moldboard loads. Hang that tremendous moldboard power onto the strongest frame of *any* grader, back it with the heaviest tandems made . . . and you have a power combination that has no equal!

Dimension after dimension of Speed Grader's hydraulic power system is consistently bigger. One of the five Speed Grader sizes, with hydraulic booster or full hydraulic finger-touch steering will do your jobs at less cost. A demonstration will bring convincing proof. It's worth taking a few moments to ask for it!

Ask for Bulletin P136.

Write for free 44 page Booklet Illustrating Over 70 Products Pettibone Makes





PETTIBONE SPEED GRADER

Eliminates the Weaknesses of All Other Graders!

Another Member of the Labor-Saving "Speedy" Material Handling Family!

PETTIBONE NEW YORK CORP.

ROME, NEW YORK • TELEPHONE 3151

SISALKRAFT
Bleached White Waterproof Paper Blankets
CAN BE RE-USED OVER 14 TIMES*

"Waterproof paper is the best, most practical method of retaining moisture in fresh concrete", says state authority in recent statement. Sisalkraft waterproof paper, *the first choice curing medium,* is tough and long lasting. It can cut costs by being re-used again and again.

Furthermore, new bleached-white Sisalkraft reflects solar heat . . . provides a new aid to concrete curing by maintaining a more even temperature, day and night, in the concrete slab.

Save money. Get better concrete. Always use genuine Sisalkraft.

Write for 26-page book on the Sisalkraft Method of Highway Curing and Protection, Dept. RS-11, Attleboro, Mass.

*Based on average job conditions — 72 hour curing period.

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SISALKRAFT
CORPORATION
Attleboro, Mass. • Chicago 6, Ill.
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Self Contained Hammer Unit Speeds Work In Close Quarters

Syntron Paving Breaker speeds removal of rock formation on excavation project.

Model PB-51

SYNTRON
GASOLINE HAMMER PAVING BREAKERS and ROCK DRILLS

Easily portable for heavy busting, cutting and digging — Syntron Paving Breakers cut time and costs on many difficult construction jobs. Deliver 2000 powerful, explosive blows per minute without using auxiliary equipment.

On Syntron Rock Drill models, the bit rotates automatically for high speed drilling of holes up to 2 inches in diameter in hardest rock.

CONCRETE VIBRATORS
Mass and Form Types

Assure uniform compacting and settling for small, medium or large concrete jobs. Electromagnetic, vibratory types for farm work. Flexible shaft, gasoline or electric models for large mass vibration.

Write today for complete tool catalogue — FREE

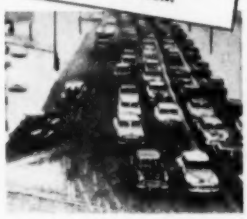
SYNTRON COMPANY
384 Lexington Avenue Homer City, Penna.

REPORT ON WINTER OF 1953-54!

How STERLING *AUGER-ACTION* ROCK SALT helped save over 100 TIMES* the total cost of DETROIT'S ice and snow-control program

*Figures courtesy Glenn C. Richards, Commissioner Department of Public Works, Detroit, Mich.

Here's What Happened When The Motor City Fought 35 Snow Storms With STERLING *Auger-Action* ROCK SALT

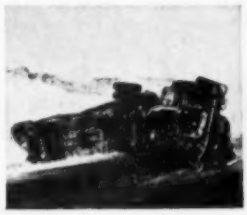


MINIMIZED EMPLOYEE LATENESS AND ABSENTEEISM

City experts agree that each of Detroit's 35 snow and ice storms, *without* rock salt's prompt action, would have meant an average ½ hour delay per employee in to-work transportation. $55,638,205 in *saved* man hours! Impassable streets would have cost retailers an estimated $26,342,500! And Detroit Street Railways would have lost more than $2,000,000 in uncollected fares. A total estimated saving of $83,980,705!

SAVED MILLIONS FOR DETROIT TRUCKERS, TOO

Detroit's Trucking Association reports a normal *full day's work* throughout the city's 35 storms last year. If streets had remained snowbound or slippery, they would have had only an average of a *half* day's work for a full day's pay—plus gasoline and maintenance costs. Estimated savings—*seven million dollars!*



HELPED LOWER AUTO LIABILITY AND COLLISION INSURANCE RATES

Though other factors besides the city's "Bare Pavement" policy entered into it, the fact remains that Detroit's liability and collision insurance rates are only about one-half those of other cities of comparable size which do *not* use straight rock salt ice-and-snow-control methods.

IN MAN-HOURS IN DOLLARS STERLING *AUGER-ACTION* ROCK SALT COSTS LESS SAVES MORE

City, County, State Highway Officials!
SEND THIS COUPON TODAY!

International Salt Co., Inc., Scranton 2, Pa.
The Detroit Report interests me. Would like to know how Sterling *Auger-Action* Rock Salt might effect similar savings in our program. Please have representative call.

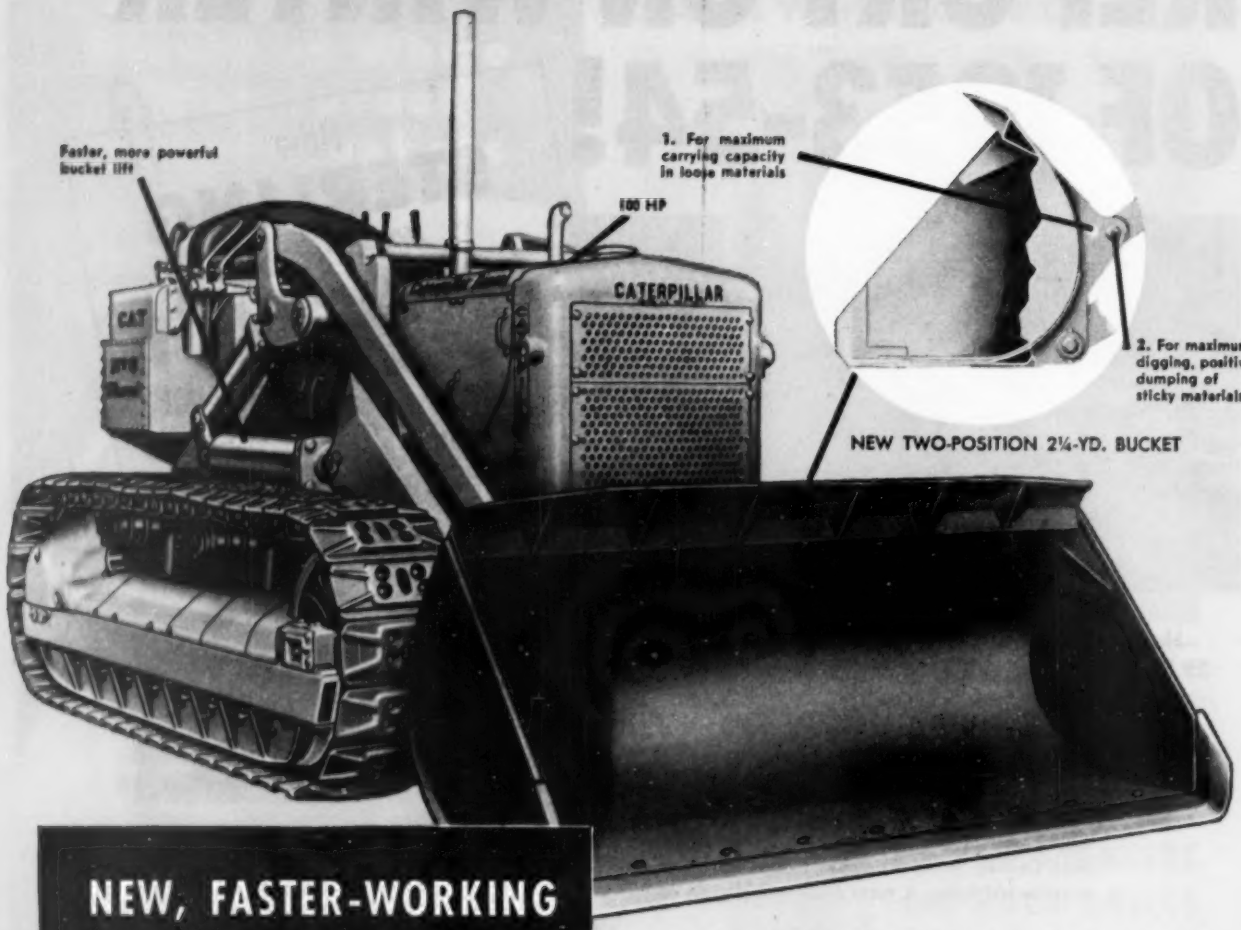
Name _____ Title _____

Department _____

Address _____

City _____ Zone _____ State _____

ANNOUNCING


Faster, more powerful bucket lift
100 HP
CATERPILLAR
CAT
1. For maximum carrying capacity in loose materials
2. For maximum digging, positive dumping of sticky materials
NEW TWO-POSITION 2¼-YD. BUCKET

NEW, FASTER-WORKING NO. 6 SHOVEL at no increase in price

NEW POWER—the CAT* Diesel Engine now gives you 100 HP, an increase of approximately 25 per cent—and you get it with Caterpillar ruggedness and economy.

NEW 2¼-yd. BUCKET gives you 12½ per cent more capacity, gets heaping loads, dumps cleanly. Exclusive two-position feature gives maximum use of bucket capacity in *any* material: rear position for clean, fast dumping of sticky materials; forward position for carrying heaping loads of loose materials.

GREATER LIFTING POWER and speed with new hydraulic pump: its pressure is stepped up more than 40 per cent for fast, positive lifting action under *all* load conditions.

These extra values cost you no more in price!

These useful attachments increase your job range: skeleton rock bucket, quarry bucket, heavy-duty narrow bucket and bulldozer blade.

Versatile new No. 6 Shovel is built to do more work at less cost

Weight distribution, engine horsepower and bucket capacity are carefully balanced so that the tracks *stay* on the ground for maximum stability.

Your Caterpillar Dealer will be glad to demonstrate the new No. 6 Shovel *on the job*. See him today. And count on him for fast service and genuine factory parts.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

4-Year Construction Log

World's Longest Over-Water Bridge

Fifteen-mile, $22,250,000 Sunshine Skyway at St. Petersburg was tough job for location parties. Construction included major use of precast deck units and precast, prestressed trestle stringers. Also resourceful methods of transporting and erecting high-level truss members.

By G. Blair White

City of St. Petersburg, Florida

AT St. Petersburg, Florida, an engineering feat planned for a third of a century is accomplished; the Sunshine Skyway, bridging eleven miles of open water where Tampa Bay meets the Gulf, was opened to the public in September, 1954.

Probably the longest crossing of open water in the world, the island-hopping project is 15 miles over-all, including six causeways and five bridge structures, the latter, for easy identification, captioned A to E from Maximo Point, St. Petersburg, to the Manatee County mainland.

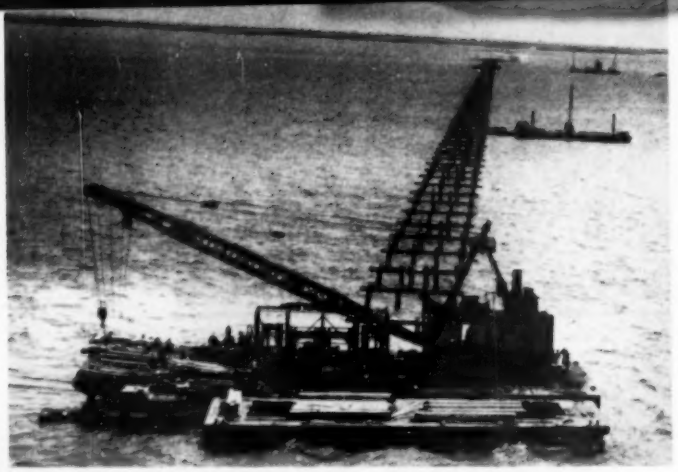
The Skyway is a toll facility bond financed by the Florida State Road Department at a cost of $22,250,000. Nine contracts were let for the bridges, embankments and miscellaneous work; two additional for roadway surfacing on embankment sections. Construction was started in October, 1950; completed in September, 1954.

Began Before War

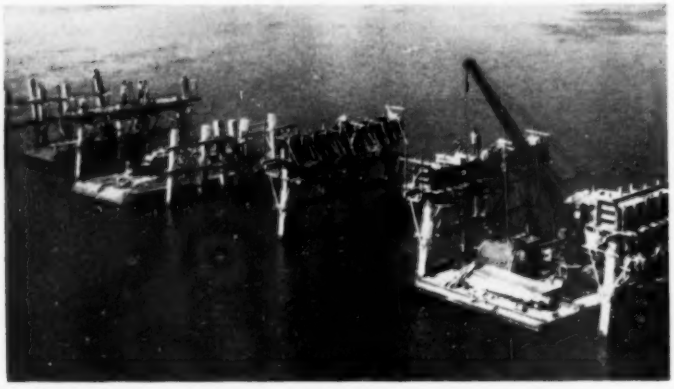
In 1940, the City of St. Petersburg set up a Port and Bridge Authority to seek establishment of deep-water port and put the city on a through highway. Across the bay Palmetto,

● Central bridge as seen during September opening. The Skyway links Tampa Bay area cities, puts St. Petersburg on a U.S. route.

● Looking south from toll plaza at Maximo Point, at St. Petersburg end of bridge. First sand-fill causeway segment is 4,400 ft. long.



● Constructing south trestle of central bridge. In foreground, Hardaway's floating crane and pile driver are building bents.



● Hendry Corporation's crews at work on pile cap forms, Structure "B", working from floating equipment.

Bradenton, and Sarasota joined the effort. The firm of Bail, Horton and Associates was engaged to plan the project.

The Authority in 1944 bought up the local ferry, set ferry revenue aside to finance initial work, and planned a three-mile steel arch bridge, smaller structures and hydraulic fills. The Authority then was given a popular vote authorizing revenue bonds, obtained rights-of-way of bay waters from the State and permission to build a bridge from the state railroad commission and the War Department.

A traffic survey, made in 1949 by Coverdale and Colpitts, New York, resulted in an estimate of 660,000 vehicles paying tolls the first year, returning an annual revenue of one million dollars from $1.75 to $5 tolls.

The War Department's authorization was contingent on lengthening the proposed central bridge from three-plus to four-plus miles, construction of four additional bridges, and a slight route change. In 1949 the Authority appealed to the state to take over. Under a subsequent enabling act the bridge became an extension of U. S. 19.

Early in 1949 the consulting firm of Parsons, Brinckerhoff, Hall and MacDonald of New York City was engaged; new plans were drawn to government specifications, and in 1950 a $22,250,000 bond issue was bid by A. C. Allyn & Co., Chicago, 30-year term, with 3.75% interest rate, to be refinanced in six years.

Early in 1950, several months before bonds were validated and sold, bids for preliminary soundings and surveys were advertised, and engineers under Peter A. Hakman took up residence near the project. "Near" is the proper adjective — there were no access roads other than rough sand trails, both ends of the crossing being cut through virgin palm jungle on Maximo Point and mangrove thickets on the Manatee shore and Terra Ceia Island.

As surveys got under way, it was apparent that here were something other than the usual problems to the engineer afoot. Not the least was the distance involved, spanning eleven miles of rough, open water with no natural high points from which to start the network for controlling the location of bridge structures.

Tampa Bay is a busy traffic artery with a channel winding for 20 miles. Fear of shoaling the bay and filling the channel, among other factors, had held back the bridge for more than a quarter-century. For that reason government engineers had increased the central bridge over the ship channel from three to 4.3-miles to insure free passage of tidal waters without silting.

Like other relatively shallow bodies, Tampa Bay often is rough, particularly in summer when near-hurricane winds may occur. Temperatures stand in the high 80's for months, and heat radiation extends up to 20 ft. above the bay. Yet pile rigs and other equipment had to be spotted with pin-point accuracy to insure piers and superstructure would be accur-

ately located and fit together properly.

The first location surveys were of limited accuracy, using the known locations of three existing navigational aids, but they did permit dredging for the hydraulic fills from Maximo Point, St. Petersburg, to begin late in 1950. Later eight stable observation towers were erected in the bay, from which engineers made precise angular measurements with theodolites. These towers together with two base lines along the shores of Tampa Bay formed the basis for the location control system or triangulation network.

Triangulation Network

Base lines for the triangulation network for the piers of the central bridge were established at east and west sides of bay, where water depths averaged 2 to 6 ft. except for about 2,000 ft. in the east baseline where water ranged from 6 to 12 ft. The two base lines, each nearly two miles long, were measured with a special constant-length steel tape, the men walking in shallow water or using skiffs. Then, by cruising from tower to tower, using a Wild T-3 theodolite, it was possible to set up a triangulation net with which to locate center lines of the 32 piers for the high-level section of the main bridge to about ¼-in. accuracy.

Unpredictable Foundation

The Bay Dredging Company bid low on the first preliminary contract which covered construction of survey control towers and the driving of 58 test piles. When this work started in mid-1950, it was learned from rock borings that there was little continuity of strata in the bay bottom, generally only layer on layer of sand, shell, marl and soft limestone, with bedrock on the south side only. And limestone strata were uneven, sometimes appearing softer as piles were driven deeper, with change in density occurring every few feet. As a result of these sub-surface explorations, it was decided to support the first 11 large piers on the south side of main span directly on rock, the remaining 21 piers on steel piling.

Meanwhile, in July, 1950, the Road Board advertised for the first two of five bridge structures and hydraulic fills on the north side of bay, and Board funds were appropriated to be replaced when bonds were sold. Atlantic Dredging Company was low bid ($338,200) for the first three hydraulic fills out from St. Petersburg, 4.7 miles. Also in July, the second contract, for bridges A and B, was awarded to Hendry Corporation of Rattlesnake, Fla., at $838,940.

As the map of Tampa Bay shows, the bridge project consists of an 11-mile crossing of open water, 2 miles of fill across a mangrove-and-water island, a ¾-mile fill and bridge across Terra Ceia Bay, and 1¾ miles of graded highway to meet U.S. 41 south at Palmetto, and about 30 miles south of Tampa.

Physically, the project is divided into eleven sections: six paved embankments, at either side of bay where water is less than 12 ft. deep, and five bridge structures varying in length from the two Manatee bridges of 336-ft. each to the 22,373-ft. central bridge.*

In October, 1950, the Atlantic Dredging Company moved in its dredge with 14-in. pipeline and began 24-hour operations off Maximo Point. It pumped sand for the first three hydraulic fills: 4,400, 10,200, and 8,000-ft. respectively, which were built to 7½ ft. above water. Fill ends were stabilized with reinforced concrete abutments to prevent erosion. These operations were carried out in such manner that a new channel was created paralleling the crossing, to become a part of the Intracoastal Canal from New York to Texas.

Structures A and B

While this work was progressing, Hendry's yards at the bay head were casting reinforced concrete pilings, 18-in. square and 18 to 16 ft. in length, for structures A and B. On the site, work started by July, 1951, when the first piling was floated 20 miles on barges equipped with derricks and steam pile driving equipment. Bents for the approaches to these two structures consisted of four or six piles with cast-in-place caps.

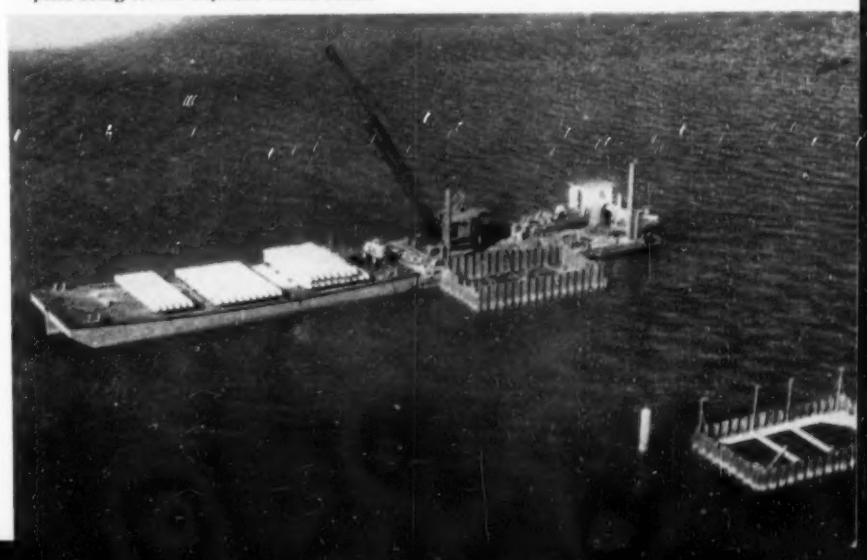
● Showing new Skyway in relation to St. Petersburg and Tampa Bay area.

For the concrete deck, which was to be of precast units, Hendry Corporation built elaborate forms at their casting yards. Precast units consisted of beam-and-deck sections, half-width, approximately 18 by 36 ft., for the 36-ft. spans of bridges A and B.

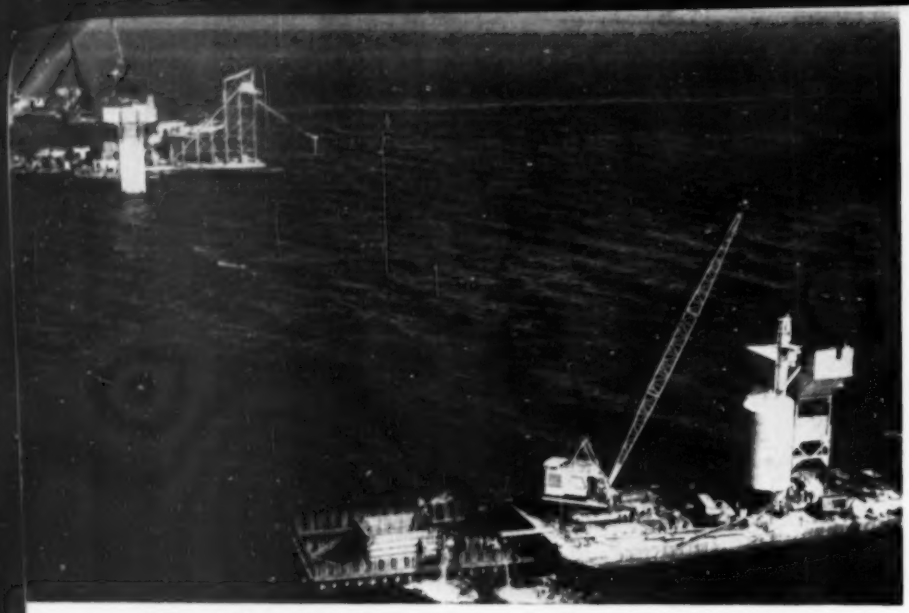
Because of the site's inaccessibility (access roads were not completed until work was well along), all materials, equipment and workmen had to be transported by boat, either from 20 miles up the bay or from the Manatee shore. Frequent line squalls during the stormy summer made it important to complete as much construction as possible off-site.

Structure A is the only draw bridge, a two-leaf bascule span, which, with flanking steel spans, measures 218 ft. with 90-ft. horizontal clearance. On either side are 14 precast deck units, totalling in all 1,226 ft. Three-foot walkways were provided, separated from the 28-ft. roadway by cast-in-place curbs; railings also are cast-in-place. The two pivot piers of the draw span were built in cofferdams. Counterweights were later cast with bascule leaves in vertical position.

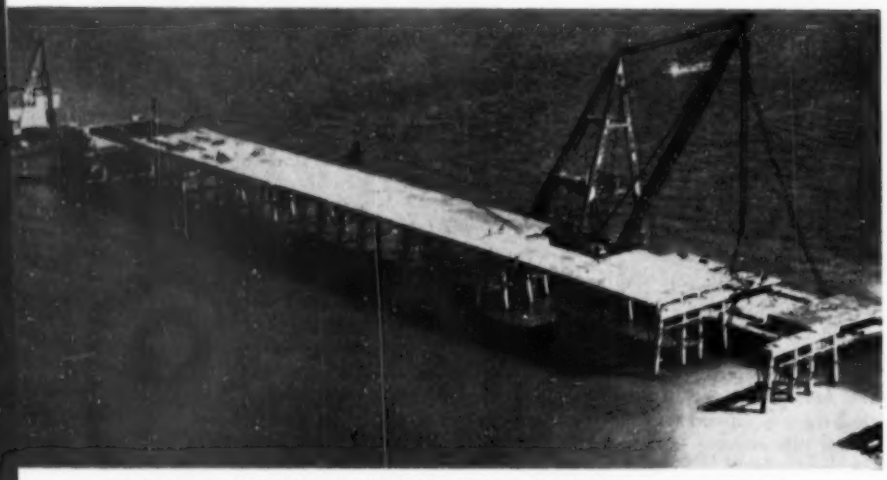
● Cofferdam sheeting in place for bascule span of Structure "A", and precast piles being set for adjacent trestle bents.



*The central bridge, 4.3 miles, is believed to be the longest continuous over-water bridge in the world. Trans-Bay Bridge, San Francisco is also 4.3 miles, but is broken by an island in mid-bay; Cheasapeake Bay Bridge is 4.1 miles over water; the proposed Michigan Straights bridge, 3.7 miles.



● Two concrete plants on barges constructing piers for contract "C". Pier cofferdam in foreground being unwatered.



● 62-ton precast deck units for bridges "A" and "B" being set on pile caps with Hendry's 100-ton crane. Every fourth bent for this structure is a tower bent.

● North cantilever arm of central bridge completed, and preparations underway to take falsework truss away on barge-supported tower frames.

When pile caps were ready for approach spans of Structures A and B, Hendry floated the precast deck units down the bay and a barge-mounted 100-ton crane lifted the 62-ton deck units and placed them on hydraulic jacks positioned on caps under the end diaphragms. The sections were later lowered into place on the jacks. Keys in beams of deck units fitted into slots in caps.

Steel spreaders on crane lift lines were fastened to eye-bolts cast into the deck section, thus insuring a vertical lift, and with brackets guiding units to place, Hendry's rig set deck sections within half-inch of horizontal position and grade.

Structure B is 1,522 ft., having 20 of the 36-ft. spans on either side of the central fixed-steel-beam span of 82 ft.; vertical clearance of 17.5 ft.

4.3-Mile Section

On May 8, 1951, the Board advertised for bids on Structures C, D and E. Bridge C is the 4.3-mile central bridge containing the high-level section with cantilever span; D and E are two 336-ft. bridges connecting embankments at south end of crossing, in Tampa and Terra Ceia Bays. Bids for the four Manatee hydraulic fills also were advertised, two of these are in Tampa Bay and two in Terra Ceia Bay.

Bids were opened June 29, 1951, and the following contracts closed:

Contract III: $241,827, to Benton Construction Company of St. Petersburg for four hydraulic fills and certain clearing and grading of roadway on Terra Ceia Island. Benton began work in July, 1951, on dredging of two fills in Tampa Bay and two in Terra Ceia Bay.

Contract IV: $7,600,000, to Hardaway Construction Company of Columbus, Ga. This contract included two items: $4,100,000 for substructure of the high-level section of Bridge C, consisting of 32 piers, from 21 to 140 ft. above water; $3,500,000 for 3⅝ miles of approach trestle; and two small Bridges, D and E, near the Manatee shore.

Contract V: $3,873,991, to Virgina Bridge Company, of Norfolk (now part of American Bridge Division of U. S. Steel) for the steel superstructure of the mile-long ship channel span, central section of Bridge C.

Prestressing and casting methods by Hardaway Contracting Co. on Contract V of Sunshine Skyway will be described and pictured in a separate article.

When bids were advertised for the trestle sections of Structures C, D and E, specifications called for alternate types of construction for the concrete spans; namely 36-ft. precast decks, 36-ft. cast-in-place decks and 48-ft. decks with prestressed concrete stringers. Hardaway Contracting Company was low bidder and utilized the prestressed concrete design with details worked out by the Preload Company of New York, realizing a saving of about $144,000 over the conventional reinforced concrete design. The job required 2,178 prestressed beams.

While precasting was in progress, the company assembled a fleet of steel barges, ranging from 40 x 75 ft. to 52 x 135 ft., on which were mounted pile-driving rigs, derricks, revolving cranes, and two complete 2-yd. concrete plants including bins and mixers. Three tugs and supply craft were necessary to transport men and materials 20 miles down the bay to the job location. (See separate list of rigs).

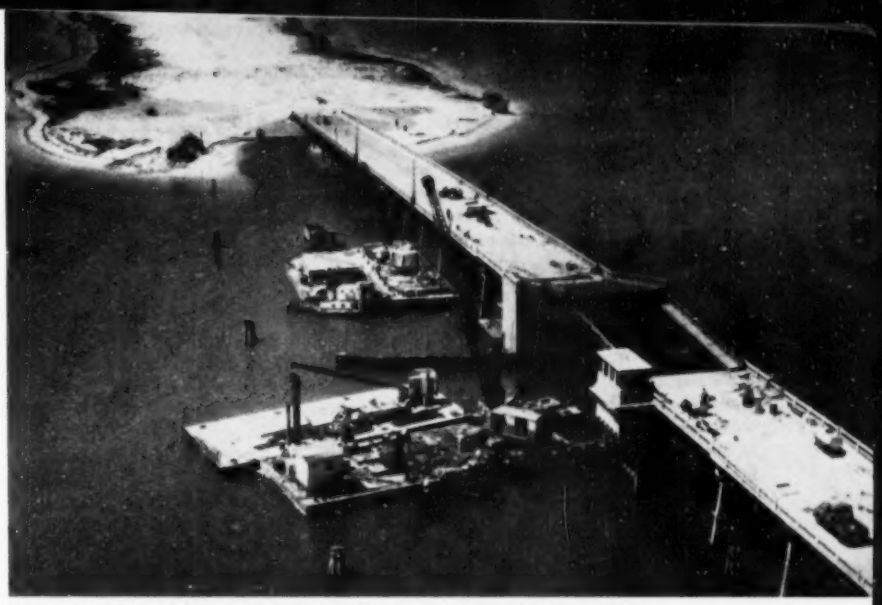
For the 21 piers of the northern portion of Structure C requiring steel H-piling, Bethlehem 12 and 14-in. sections up to 53 ft. long were used. Piles were spaced 42 in. each way. The remaining 11 piers from Pier 6 South to the beginning of south trestle section of Bridge C were constructed on spread footings on limestone rock.

Central Bridge Cofferdams

In March, 1952, Hardaway began construction of cofferdams for the 32 piers of the central bridge. Frames were assembled at the Port Tampa yards, barged down the bay, and spotted to position, where cranes held them while pile rigs placed 60-ft. spud piles at each corner.

A McKiernan Terry 9-B-3 hammer was used to drive the sheet steel piling, which had to be reinforced owing to heavy seas of the storm season. Frames were of two or three rings according to depth; 20-in. beams were used for reinforcing at top of cofferdam and for diagonal and cross bracing. The two largest cofferdams were 45 x 108 ft.

After the cofferdams were excavated and foundation piles were driven (with 10-B-3 and 11-B-3 hammers rigged for underwater operations) tremie seal was completed. Salt water was used for the underwater concrete mix; fresh water, carried in the hollow steel barges, was used by the floating concrete plants for piers above water. Six-inch Jaeger Sure-Prime pumps were used in clearing cofferdams, 3-in. pumps there-after to keep out seepage.



● Structure "A" with lift span over Intracoastal Canal, nearing completion.

Cofferdams were then ready for unwatering after which pier forms were erected and the balance of pier concrete placed in the dry. Form sections 7 to 10 ft. high were prefabricated off-site and barged to location, positioned, and set by cranes.

By June, 1952, several of the piers were well above water level. Some were capped and ready for the steel deck girders, required for six 100-ft. and six of 140-ft. spans flanking the truss spans. These piers rise from 21-ft. above water on a 5% grade to the high-level section. This section includes the 1,584-ft. through-truss cantilever span flanked by two 289-ft. deck-truss spans, and the 24 deck-girder spans, making a total of 5,621 ft. at the high-level.

Late in 1952 an October storm delayed construction when a large number of barges and construction rigs broke loose from their moorings; three were sunk and others blown out into the Gulf. All but two were recovered and salvaged. One of the piers, slightly damaged by a barge, was easily repaired.

The tremie seal required 20,420 cu. yd. of concrete, the pier footings 11,350 cu. yd.

Winter months brought calmer weather. Concentrating on the southern approach while piers were under way, Hardaway by late 1952 had Structures D and E connecting the Manatee causeways well along, and the Manatee approach trestle of the central bridge 75 per cent completed. This work was rushed so that workmen and materials could be moved in over the approach.

By March and July, 1953, paving contracts VI and VII were executed for the roadway approaches from Terra Ceia and Maximo Point ends, at $260,289 and $136,268 respectively.

By mid-1953, engineers and steel workers from American Bridge were on hand and preparations begun for erecting the superstructure of the mile-long high-level section. This was the fifth contract, totaling $3,873,991.

By July, with deck girders in position on piers 5 to 16, both north and south of the truss-span section, and concrete surface virtually complete on the curving south approach trestle, construction of the north approach

Floating Equipment Used for Structures C, D and E on the Sunshine Skyway

52 x 137-ft. barge, Wiley whirley crane, 100-ft. boom, 25-ton lift.

32 x 120-ft. barge, Clyde whirley with 100-ft. boom, 40-ton lift. (Sunk, was salvaged).

30 x 120-ft. barge, Northwest 25-D (¾-yd.) crane.

32 x 120-ft. barge, Link-Belt Speeder 2½-yd crane. (Sunk, had to replace).

American stiffleg derrick on 40 x 75-ft. barge, 90-ft. boom, American hoist. (Sunk, was salvaged).

40 x 175-ft. barge, 2 cu. yd. concrete plant, with crane and inclined runway.

38 x 175-ft. barge with 1¼ cu. yd. concrete plant and 2 cranes, tandem drums. (Sunk, had to replace).

42 x 100-ft. barge with American Revolver crane, 60-ton capacity.

38 x 86-ft. barge with American Revolver crane, 22-ton capacity, 100-ft. boom.

A Vulcan 800 pile extractor used to pull cofferdam frames.

3 tugs — 3 personnel craft.

Some of above units use spuds for positioning, some equipped with anchors and cables.

commenced, beginning at the end of the third Maximo causeway.

Aided by favorable summer weather, the eight central twin-shaft piers were made ready; by November, the first truss span was ready to float to place, constructed on temporary tower bents near Pier 6 South by use of traveler cranes operating from deck-girders of the high-level section.

Two deck trusses thus were placed in November and December, 1953, a third in early January. A fourth truss was constructed, fitted with falsework at either end and with special reinforcing on the deck, then floated to position between Piers 1 and 2 South, where it was lowered to temporary bents to act as falsework for the construction of the south anchor arm of the main cantilever unit.

When the south arm was completed, the temporary supporting span was floated to the north side of channel and again used for supporting construction of the north anchor arm. By this ingenious method the use of falsework and time and labor was held to a minimum, while construction 150 ft. above water was carried on without additional risk.

The safety record on the lower Tampa Bay bridge is remarkable. A few accidents occurred, but there were few serious injuries and only one fatality, occasioned by a fall in one of the pier cofferdams. Considering the record of other like projects — where many lives have been lost, such as those which occurred on the Quebec bridge and the Overseas Highway to Key West — this is indeed an outstanding record.

By late May, 1954, both anchor arms were complete and the span used as falsework again was floated out, this time to its final position. Work began on cantilevering out the central span from both anchor arms.

Again aided by favorable weather, the two halves of the cantilever span met in center within a fraction of an inch and were joined July 1. Within a few days final members were erected and work on the steel deck begun. At the September 6 opening, the bridge was ready.

Standards used in the design of the Tampa Bay crossing in general are those of the AASHO. Because of the extreme exposure conditions special consideration was given to wind loads and forces acting on both substructure and superstructure of the high-level section. Wind loads of 30, 50 and 75 psf. intensity were used in setting up a table of unit stresses which governed structural design. This table was considered important also in planning the erection of the cantilever span where erection loads are added to live and dead loads, impact and wind loads.

Considering that the bridge would be used by heavy truck-trailer traffic, though probably not in sufficient quantity to overload any one span, H-15 loading was selected for design of steel trusses and girders. Floor system of these spans was designed for H-20 loading. Both sub and superstructures are designed to withstand wind pressures up to 75 psf., or a possible gust of 175 mph.

The staff of engineers and construction superintendents who planned and supervised erection of the Sunshine Skyway include: Parsons, Brinckerhoff, Hall and MacDonald, consulting engineers, with Maurice N. Quade as partner in charge and Peter A. Hakman as resident engineer; W. E. Dean of the Florida State Road Department; D. M. Plyler, project manager and Arthur Goodale, general superintendent for Hardaway Construction Company; Edward Nimmergood and Elbert Powers for the American Bridge Division, U. S. Steel Corporation; Capt. F. Hendry and George Asbell of Hendry Corporation.

(Note: This manuscript was prepared under supervision of Peter A. Hakman, Resident Engineer for the Tampa Bay Bridge.)

"Highway Engineering"—Authoritative New Book by Hewes and Oglesby

PRACTICING engineers as well as students will find the entire practice of modern highway building compressed into a new book "Highway Engineering", published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, New York. ($8.00).

The 628-page book represents a collaboration of the late L. I. Hewes, chief, western headquarters U. S. Bureau of Public Roads, and C. H. Oglesby, professor of civil engineering, Stanford University.

In the foreword, retired public roads commissioner Thomas H. MacDonald notes that this book is a fitting sequel to the definitive previous book by Dr. Hewes, "American Highway Practice", published in 1941 and 1942. Like its earlier work, the present book represents the full awareness of the dynamic quality of highway engineering. Because of the magnitude of the undertaking, he obtained the collaboration of Professor Oglesby, and the book was well advanced at the time of Dr. Hewes' recent death.

In Professor Oglesby, Dr. Hewes found an engineer particularly qualified for the work at hand, further notes MacDonald, and one who is in accord with the objectives of the book. Professor Oglesby brought to this task a broad experience in highway engineering, including nine years in the Arizona Highway Department. It is largely through his effort that the book now appears in print.

"A lucid, authoritative, and thorough exposition of the best modern highway practice," concludes MacDonald in the foreword.

In Professor Oglesby's preface he states that the book is primarily designed as a text for junior and senior college courses in highway engineering, but that a second objective is to offer a starting point for advanced courses and individual study. A third aim is to summarize important new developments as an aid to practicing highway engineers. Wherever possible the governing principles underlying each topic are developed first; then current practice is explained in terms of these principles. Finally research findings that point up the shortcomings of present-day knowledge and methods are outlined in order to indicate the probable changes to come. The book is heavily footnoted with references to current technical literature.

The authors throughout show an awareness that present day knowledge in almost every phase of highway engineering is being rapidly expanded by intensive research and study, and that many commonly accepted practices are being modified or seriously questioned.

As compared with many other books in the highway field, this one places much greater emphasis on engineering design and underlying design principles and much less on construction practices. Economic data are given great emphasis, with detailed information on highway-user costs and techniques for justifying or comparing highway improvements in terms of savings to users in time and in operating and accident costs. Other chapters which have been given emphasis without, however, slighting other subjects are those on highway finance, rights of way, highway drainage, and traffic engineering.

Editorial

Briefly Noted . . .

A new book on highway engineering is just published which is likely to stand as a landmark among basic references in our field. "Highway Engineering" by Laurence I. Hewes, late chief, Western Headquarters, Bureau of Public Roads, and Clarkson H. Oglesby, Professor of Civil Engineering, Stanford University, is the book — see review elsewhere in this issue.

Suffice it to say here that this book, which has been painstakingly checked over by top Bureau personnel, accomplishes two things not always adequately treated in a text book. It constantly stresses principles and thus helps the student in reasoning out and understanding the practices delineated; and it contains the atmosphere of dynamic change which is the chief characteristic of highway engineering.

Every highway student between the ages of 18 and 80 will find this book useful and at times inspiring.

•

In Chicago recently 150 traffic tickets were given in a single day to motorists who ventured into one-way streets in the wrong direction.

When this many drivers do something "wrong," it's time to see if the street signing isn't at fault. In our experience, one-way street sections, especially when first established, sometimes need very conspicuous, oversize or lighted signs as a means of helping motorists correct driving habits.

•

The importance of better laws to enable highway planners to set up roadside and access controls along main highway routes is emphasized in national publicity by the American Automobile Association.

"Major new highway construction may prove to be a multi-billion dollar waste unless provisions are soon made to protect and zone the roadside," said an AAA spokesman, following a meeting of the executive committee of this organization which represents several million motorists and many motor clubs throughout the nation. The Association in a resolution urges affiliated motor clubs to adopt as primary 1955 legislative targets the enactment of state laws on highway zoning and controlled access.

This type of constructive action by citizen groups will go a long way to help our highway departments to eliminate "ribbon development" or uncontrolled commercial development, such as has ruined many of our older highways near cities as safe efficient transportation arteries.

•

That peppy little sheet, "Highway Extension News," issued by Professor Ben Petty at Purdue University, notes and ponders over the ways of county officials. The 40th annual Purdue Road School held last April, which had a big attendance, was without any representation from sixteen of Indiana's counties. But from eight of the state's ninety-two counties, the three commissioners, the surveyor and the road supervisor were all in attendance.

Some of the counties apparently were too poor to send any one, or else their county men already know everything and don't need these fancy short courses.

•

We note that Robert Moses, famed parkway designer and administrator for Metropolitan New York, has resigned from a high post in the National Safety council over a difference of opinion on the policy to take toward speed control. The ROADS AND STREETS editors join with Mr. Moses in the stand that speed control is a primary factor in accident and fatality reduction on our highways.

The achievement on the New Jersey Turnpike, just announced, would tend to justify this stand. The fatality rate on the 118-mile pike was reduced to 2.62 per 100 million vehicle miles for the 1954 first half, a reduction of 34% over the first half of 1953. This reduction, accomplished despite a continued rise in traffic volume, seems directly related to toughening up on speed control.

•

So many proposed toll projects have been found feasible that it is a real piece of news to hear that toll roads in two states were recently declared impractical. Such was the pronouncement in South Dakota recently, where Governor Anderson urged the state to concentrate on its state trunk highway system of free roads.

Likewise in Wisconsin a proposed toll road was found not feasible at this time. We refer to the projected route from the Illinois state line to the Minnesota border.

The road building industry wants turnpike jobs, but no one in the industry or in official highway circles wants to see the cause of road building given a setback by the undertaking of impractical projects that will later turn out to be financial lemons.

"Feasibility" is still the biggest word in toll road planning. It should be the biggest word in free road planning.

•

We have commented before on the valuable practice of organizing junkets for city officials to visit other cities to see how expressways are being built there. The visitors return home not only inspired by the progress being achieved elsewhere, but inevitably filled with new ideas for solving their own problems.

The Chicago papers recently carried reports of visits by Ralph Bartelsmeyer, chief engineer of the Illinois Division of Highways, and Wm. J. Mortimer, superintendent of highways of Cook County. They toured the Texas cities visiting expressways and later the west coast cities. Hal Faust of the Chicago Tribune who accompanied them gave Chicago people an informative series of articles on the principles of finance, design and location being applied in other cities who are forging ahead of Chicago in solving their expressway problems.

IT COSTS LESS TO BUILD GOOD ROADS THAN TO HAVE POOR ROADS

Busy But Competitive Times Ahead, AGC Survey Predicts

George C. Koss, highway contractor, nominated to head Associated General Contractors.

SIGNIFICANT problems facing the contracting industry were taken up by the Associated General Contractors of America, Inc., at its mid-year meeting of Governing and Advisory Boards. The AGC leaders, some 400 in number representing 124 chapters and branches, met in St. Louis on September 27-29.

For president of AGC during 1955 a paving contractor was nominated — George C. Koss, of Koss Construction Co., Des Moines. Frank J. Rooney, of Frank J. Rooney, Inc., Miami, Fla., a building contractor, was nominated vice-president. New officers will be installed at the forthcoming annual meeting of AGC, in New Orleans, March 14-17, 1955.

● At the AGC board meeting: H. E. Foreman, managing director; Frank J. Rooney, vice-president nominee; George C. Koss, president nominee; and John MacLeod, president of AGC.

Managing Director H. E. Foreman, Washington, D. C., in presenting his report to the boards reviewed accomplishments of the association, adding that in carrying out its work the AGC has regarded the interests of the public foremost in any of its actions. Executive director James D. Marshall explained the organization and operations of the national staff which are designed to most effectively serve the membership.

The AGC leadership adopted a positive policy on labor legislation — one which opposes any weakening of existing legislation with respect to the construction industry and calls for positive handling of aggravated jurisdictional disputes by the National Labor Relations Board.

The assembly approved revision, clarification and simplification of the AGC Governing Provisions, subject to final action in New Orleans.

The conclave also recommended:

1. More orderly programs of heavy public works projects, with appropriations adequate to avoid disruption of the heavy construction industry, whose activity in developing national resources is a major factor in defense and the economy.

2. Establishment of local programs between general contractors and subcontractors in the proper handling of bids for subcontracts, and a statement of the need for subcontractors to accept their fair share of responsibility for their own ethical actions in maintaining fair, bona fide competition.

3. That government agencies do not read or consider any bid unless accompanied by specified bid security.

A continuation of the present record construction volume during the next six months, with stable material prices and wages and increasing job competition, is indicated by a national AGC survey.

Present construction levels, the survey indicates, will be maintained or increased in many sectors in the building, highway, and heavy engineering fields.

The predominance of optimistic replies was fairly uniform geographically. In some local areas, however, expectations varied, evidently because of local conditions, which accounted largely for the minority of answers anticipating a reduced volume.

Replies: Building — increase 43%, no change 37%, decrease 20%, Highway — increase 59% no change 26%, decrease 15%. Heavy — increase 42%, no change 34%, decrease 24%. Thus the outlook appeared strongest in highway construction.

The confident industry outlook is all the more significant since it follows a long period of rising construction. The 1953 volume set an all-time record of more than $50 billion of construction put in place, including $35.25 billion of new construction, $15 billion maintenance and repair.

The seasonally adjusted annual rate of new construction for the first eight months of 1954, according to the Departments of Labor and Commerce, exceeds $36.5 billion, up 3.5% over last year — a new record.

Big Job Backlog Seen by Contractors

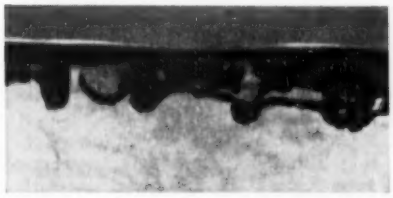
Construction, largest single production activity in the nation's economy, accounted for nearly $1 in every $7 of the gross national product of $364.9 billion in 1953. This ratio is being exceeded this year. It has been widely recognized by economists, government officials and businessmen that the continuing record volume of construction this year has provided the biggest mainstay of the national economy.

The AGC survey report notes that there remain huge backlogs of construction needs, particularly for community purposes, such as highways, schools, water and sewerage facilities, and hospitals. President Eisenhower summarized these backlogs in his Economic Report to the Congress last January: $8 billion annually needed for the next 10 years for highways, $6.75 billion for schools, $1.8 billion for water and sewerage facilities, $1.5 billion for hospitals.

A major reason for continuing high levels of construction is the relative stability of construction costs and materials supply. Questionnaire answers on anticipated material prices and wage rates shows the following results: Material prices — to increase 15%, no change 75%, decrease 10%. Wage rates — to increase 39%, no change 60%, decrease 1%.

DOW

Pellets of Peladow were placed on a cake of ice and their penetration rate was recorded.



The dark area in this enlarged photograph shows Peladow penetrating in only 45 *seconds* —illustrating its fast and effective action.

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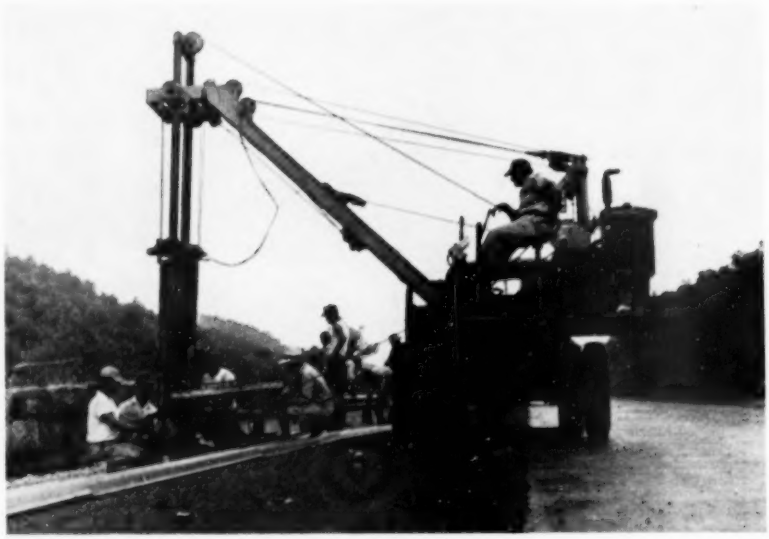
Job and Equipment Ideas

Guard rail post driver

The setting of guard rail posts and other posts along the road in connection with new construction or maintenance has traditionally been a slow and laborous task — one of the last areas of work to be mechanized. Contractors as well as highway department maintenance crews have devised various mechanical means, some of which have worked well.

An example of the commercially made equipment that is starting to come into this picture is here shown. The unit is a Little Giant post driver employed by Wright Contracting Co. of Columbus, Georgia, under the Contract No. 39 involving guard rail construction for the West Virginia Turnpike. The machine which swivels on a truck and acts much like a pile driver is reported to have done a speedy job for the Wright organization although actual daily performance figures are not given. According to the manufacturer, typical users have set 375 to 450 posts per day with this machine.



● Guard post driving rig on West Virginia Turnpike.

Rolling outrigger saves time on hoisting jobs

Anyone familiar with truck cranes and their use knows how necessary it is — but how time-consuming, too — to extract and block up outriggers prior to any lifting operation. The rolling outrigger pictured here seems to be one answer to the old problem. It's attached to a Lorain MC 524 belonging to Leake & Nelson, Inc., rigging contractors from Bridgeport, Conn.

Bob Callahan, boss rigger, admits that it's not his original idea, but is, rather, "an import from the West Coast with a few refinements we've added."

The rolling outrigger consists of four steel wheels fastened to a frame of welded steel channels, the assembly being fairly well balanced. The wheels are capped with Goodyear solid tires, size 20 x 9 x 16. If the crane is to remain in its place for some time the rigger boss uses the regular steel pyramids shown in their slots on the rear of the rig. If there's continuous moving back and forth, however, the wheels are invaluable on any reasonably hard and level ground. The entire frame is fastened through a ball-and-socket arrangement to the threaded shaft and hung so that the rubber wheel caps are about ½ inch off the ground. There's occasionally a certain amount of scuffing on these caps, especially on sharp turns, but it's far better than unblocking and re-blocking in a new location, which might only be a few feet away. "One word of caution," says Bob. "Make sure the area is swept clean ahead of the rollers and that no pieces of wood, stone, scrap iron, etc., can disrupt the best and fullest bearing surface. Otherwise the gadget is perfect."

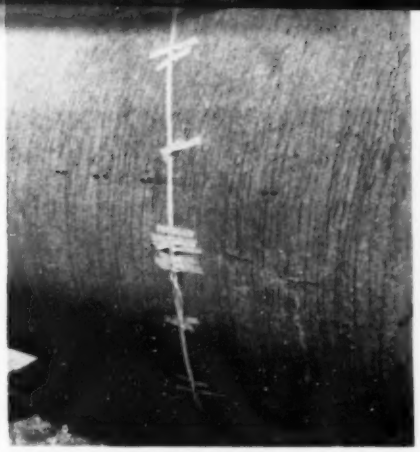
● Hard rubber tired dolly serves as outrigger.

Pipe cut made with explosive cord

A unique way of cutting reinforced concrete culvert pipe in the field with explosives is currently being subjected to experimentation by United Concrete Pipe Corporation at their Baldwin Park, California, plant. Preliminary results indicate that it may be a faster and cheaper method.

It is believed that J. A. Payton, a contracting firm operating out of Riverside, California, was the first to successfully cut concrete pipe with explosives in this manner, having adapted the procedure from their customary practice of cutting obstructing rocks with primacord.

The pipe company has conducted experiments with various sizes of reinforced concrete culvert pipe with



● Primacord wrapped around 72 in. reinforced pipe preparatory for a miter cut.

● Pipe after cord was fired. Clean, distinct crack completely encircles inside of pipe. No other cracks.

● Thirty-six in. reinforced culvert pipe completely severed by blast. Longitudinal reinforcement bars are broken and only circumferential rod remains intact.

varying wall thicknesses, with the assistance of Jack Cunningham of the Atlas Powder Company. Atlas 100 grain primacord was used and detonated with electric blasting caps. The primacord must be carefully wrapped around the pipe, especially for a miter cut. Varying numbers of turns of the primacord around the pipe and the position of the cord, i.e., side by side or on top of other turns, were found to be very important in producing the desired amount of fracture in each size of pipe. The blast travels through primacord at an approximate speed of 18,000 feet per second, producing an instantaneous effect. A distinct, clean crack can be obtained completely around the inside of the pipe to permit chipping away the concrete and cutting the reinforcing steel within a one inch area, leaving clean cut edges.

It is estimated that cutting concrete pipe in this manner will save 75% to 80% of the labor costs involved in the current method of using an air-hammer, or a hammer and chisel, which requires a 4-in.-wide cut and leaves a jagged edge to be smoothed.

Cutting concrete pipe with explosives does have the obvious drawbacks of noise, concussion, and dangerous characteristics inherent to any explosive. United Concrete Pipe Corporation is continuing its experiments which are expected to be concluded shortly.

Floating batch plant

Where do you locate a concrete batching plant when your job is hemmed in between a busy highway and a river?

To solve this Pittsburgh space problem, John F. Casey Co., contractor for bridge piers and retaining walls, erected their plant on a barge and floated it from their yard to the job along the Monongahela river. The installation eliminates not only the space problem, but the costly, long hauls through heavy traffic with the truck mixers.

The Blaw-Knox batching plant has a capacity of 100 tons of aggregate and 400 barrels of cement and will supply 60 cu. yd. of concrete an hour. Materials are delivered by river barge to the plant. Concrete is mixed by Blaw-Knox Truck mixers and fed to roller-gate concrete buckets (also B-K) for placing in B-K steel forms for the retaining walls and piers. The plant was moved along the river as the job progressed.

This plant is for 18,000 cu. yd. of concrete pier work for a new double-decked bridge near the point of Pittsburgh's Golden Triangle.

● John F. Casey Company's barge-mounted concrete batch plant solves several problems.

Doetsch Brothers, Evanston, Illinois contractors, keep their two HD-9G's busy on a variety of jobs, like their extra-production ability: "The 2-yd HD-9G sometimes will do up to three times as much work as a 1-yd machine. Let's say the smaller unit will load a 10-yd truck in five minutes, roughly — then a 9G will load it in two minutes. Where a 1-yd machine will keep one truck going, a '9' will keep three going."

you can handle BIGGER jobs, TOUGHER jobs with this 2-YD Tractor Shovel

Two Tractor Shovels have cut production costs by bringing greater efficiency to a Midwest rock quarry. These two machines, equipped with standard 2-yd buckets, load rock directly from quarry face to rock crusher, eliminating the need of continually moving the crusher. The speed of the two Tractor Shovels enables the crusher to load out 135 eight-ton trucks a day.

Here's a Tractor Shovel with the handiness of the popular Allis-Chalmers 1-yd unit— but with the power, strength and ability to give more than *double* the working capacity.

The Allis-Chalmers 2-yd HD-9G is just right for the jobs that overload lighter machines. Its husky 72-drawbar-hp engine packs big-job stamina. The heavy-duty, 2-yd bucket is shaped to roll-in material — get a full load with less tractor effort. It lifts loads to a dumping height of 11 ft, 4 in. There's plenty of stability, too, with 29,900 lb of weight and extra long tracks. You'll also find many other proved production-boosting features like: all-steel, box A-frame; 1,000-hour lubrication intervals for truck wheels, idlers and support rollers; simple shift pattern; quick-response hydraulic system; unit construction.

Your Allis-Chalmers dealer has all the facts. Ask him to show you how the big-production HD-9G can improve your operations.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Traffic Safety and Control

State-wide safety study completed in North Dakota

The first highway safety study state-wide in scope has been completed in North Dakota by the Automotive Safety Foundation. The Foundation, which was asked by the North Dakota Legislature to make the study, made sweeping legislative and administration recommendations intended to reduce the hazards of highway travel.

Some of the major measures advocated by the Foundation include:

Creation of a new Department of Public Safety.

Enactment of laws making it mandatory that drivers and investigating police officers report all accidents to this new Department.

Major changes in the law setting up Rules of the Road.

A Model Traffic Ordinance for cities, with legislative provision for adoption by reference.

Removal of limitation on personnel, and addition of 46 officers to the State Highway Patrol.

Sweeping changes in driver license laws, but retaining present driving ages.

Legislative action to encourage expansion of the high school driver education program, and for greater safety in school transportation.

Creation by statute of an official Coordinating Committee, comprised of State officials dealing with highway safety matters.

Research for the report was directed by Norman Damon, vice president of the ASF, and a number of other national organizations — the National Safety Council, Northwestern University Traffic Institute, American Association of Motor Vehicle Administrators, International Association of Chiefs of Police, American Bar Association, and National Commission on Safety Education of the National Education Association.

Jumbo truck-mounted traffic warning signs

In the belief that most warning signs, designed to protect maintenance workers, are too small, officials of the Pennsylvania Turnpike Commission have devised really big signs that no on-coming driver can possibly miss.

One of these signs is pictured here. It is mounted on the back end of an all-wheel-drive truck of the type used for winter snow and ice control and for general repair work in summer. The truck in this instance is spotted on the outside edge of the outer lane, about 1,000 feet back of a surface patching crew. The truck is moved forward as the crew advances.

Note that in addition to the big sign a red flag is mounted at the top of the sign, to further insure catching the driver's eye in time for a speeding vehicle to swerve to the free inner lane. This type of sign is used in conjunction with the more mobile, rapidly advancing maintenance operations. Where such work as pavement cuts and replacements are involved, requiring a day or more of work at a single point, a series of lighted signs, barricades and flares are used to converge traffic to the open lane.

● On-coming drivers can hardly miss this truck-mounted sign — seen on Pennsylvania Turnpike repair work.

Back Fill Curbing and Trenches *5 TIMES FASTER!*

The Model 610 Hopper Conveyor backfills trenches and curbing up to 24″ high with stone, cinders, sand, etc. in one-fifth the time required by previous methods. On the paving job shown above, 24″ curbing was backfilled with crushed stone at a rate of 50 feet per minute.

Write today for information on this time-saving, cost-cutting unit for road widening and fill work. An actual demonstration can be arranged on your job.

DISTRIBUTOR FRANCHISE AVAILABLE IN SOME TERRITORIES

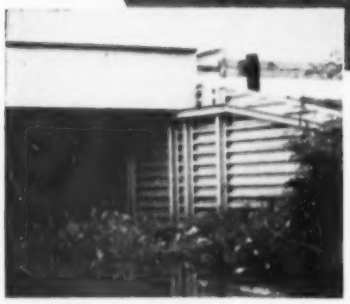
POWER-PACK CONVEYOR CO. 13910 ASPINWALL AVE. CLEVELAND 10, OHIO

Contract method used for 98.9% of F. A. roads

During the years 1946 through 1953 inclusive, the contract method of construction has been employed almost exclusively on the Federal-aid highway construction program. Through the help of the Bureau of Public Roads the accompanying data is made available:

Calendar Year	*Total Volume of Federal-aid Work (nearest $5,000,000)*	*Percent by Contract*	*Percent by Day Labor*
1946	$ 505,000,000	99.6	0.4
1947	650,000,000	99.2	0.8
1948	745,000,000	99.0	1.0
1949	640,000,000	98.4	1.6
1950	820,000,000	99.2	0.8
1951	805,000,000	98.6	1.4
1952	930,000,000	98.8	1.2
1953	970,000,000	98.7	1.3
1946-1953 *inclusive*	$6,065,000,000	98.9	1.1

Versatile Structural-Plate BRIDGE FLOORING . . .



Standard U.S.F. box corrugated Structural-Plate Bridge Flooring is now being used with steel piling in the construction of bridge abutments and retaining walls. This rigid and durable material serves perfectly as an earth retainer when welded in place behind the piling. Used conventionally as bridge flooring it is welded to the stringers and surfaced with a bituminous surface course, providing the easiest-of-all replacement for worn, rattling plank floors.

WRITE FOR MORE FACTS!

USF UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO
PRODUCTS Hollow Metal Doors • Prefabricated Metal Buildings • Window Walls
Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe

Meetings Ahead

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS — Annual meeting, Olympic Hotel, Seattle, Washington; Nov. 9-11.

NATIONAL SAND AND GRAVEL AND NATIONAL READY MIXED CONCRETE ASSOCIATIONS, — Annual meeting, Miami Auditorium, Miami, Fla.; Jan. 9-13.

AMERICAN ROAD BUILDERS ASSOCIATION — Annual meeting, Roosevelt Hotel, New Orleans, La.; Jan. 10-13.

CONSTRUCTION INDUSTRY MANUFACTURERS ASSOCIATION — Annual meeting in conjunction with ARBA meeting, New Orleans in January.

HIGHWAY RESEARCH BOARD — Annual meeting, Washington, D.C., Jan. 11-14.

ASSOCIATED EQUIPMENT DISTRIBUTORS, INC., — 1955 meeting, Conrad Hilton Hotel, Chicago, Ill.; Jan. 23-28

NATIONAL CRUSHED STONE ASSOCIATION, —Annual convention, Netherland Plaza Hotel, Cincinnati, O.; Feb. 7-9.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS — Annual meeting, Jung Hotel, New Orleans, La.; February 7-9.

AMERICAN CONCRETE INSTITUTE — Annual convention, Schroeder Hotel, Milwaukee, Wis., Feb. 21-24.

AMERICAN CONGRESS ON SURVEYING AND MAPPING AND THE AMERICAN SOCIETY OF PHOTOGRAMMETRY — Annual meetings, Hotel Shoreham, Washington, D. C.; March 7-11.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. — Annual convention, Roosevelt and other Hotels, New Orleans, La.; Mar. 14-17.

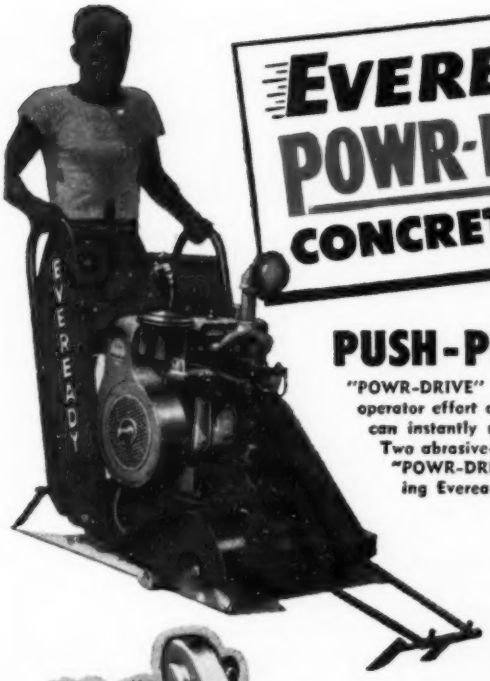
Florida seeks consultants

The Florida state road board has authorized temporary employment of private engineering firms to aid its own engineers in carrying out road and bridge construction projects.

A resolution adopted by the board asserted that "plans and specifications are so numerous and extensive for a road and bridge program of such magnitude that it is not possible for the number of engineers and engineering personnel regularly employed by the department to draft and prepare all such plans and specifications and perform other engineering services incident thereto without consequent delay in such program."

Also adopted was a motion by Board Member Francis Whitehair of DeLand that counties and cities in his district which have paid private engineers for work on primary road projects in their territories be reimbursed.

EVEREADY POWR-DRIVE CONCRETE SAW



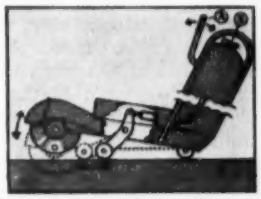
Ask Your EVEREADY Dealer for the Most Complete Line of Masonry and Concrete Cutting Equipment

We've taken the PUSH-PULL Out of Concrete Sawing

"POWR-DRIVE" smoothly drives saw forward at your controlled speed . . . saves operator effort and increases cutting footage per day. With "POWR-DRIVE" you can instantly regulate the cutting speed to your various cutting requirements. Two abrasive-coated wheels act as a friction drive in contact with both rear saw wheels. "POWR-DRIVE" is engaged or disengaged by a convenient foot lever control. See the amazing Eveready "POWR-DRIVE" Concrete Saw at your local Eveready Dealer.

PATENTED EVEREADY FEATURES

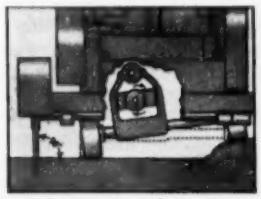
Shown at the right are three exclusive features that make EVEREADY the fastest, most efficient concrete and asphalt cutting saw. Other features are: Dashboard controls for greater ease in operation and maneuvering; blade depth control that permits sawing to a specified depth.



Two easy strokes of Hydra-Eze Handle (A) and hydraulic power lifts blade fast —straight out of cut. Quarter turn of Hydra-Eze Blade Release Lever (B) and hydraulic power feeds blade gently, smoothly into material.

BUY COMPLETE OR ADD THE NEW EVEREADY POWR-DRIVE KIT LATER

The "POWR-DRIVE" Kit comes completely assembled . . . only four holes—four bolts are needed to install the kit on any Eveready Concrete Saw. "POWR-DRIVE" Kits are sold only by authorized Eveready Dealers.



On rough or uneven surfaces—the blade on an EVEREADY Concrete Saw always cuts in a perfect, true, vertical plane. TRI-MATIC BLADE ALIGNMENT prevents binding, twisting, or tilting of the blade as the saw moves over uneven or broken surfaces.

"POWR-DRIVE" cuts MORE Concrete Every Hour . . . Cuts Costs on Every Job! and EVEREADY'S "PROVEN QUALITY" is Your Guarantee for "PROVEN RESULTS"!

EVEREADY Concrete Blades

EVEREADY RED-I-CUT DIAMOND BLADES

For faster cutting — PLUS maximum blade life — regardless of the type Concrete or Asphalt cut. Red-I-Cut Blades fit EVERY make and model saw.

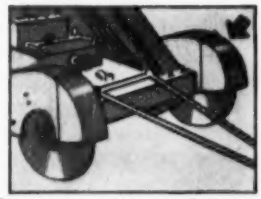
EVEREADY TUFFIE CONCRETE BLADES

Cut Green Concrete at ONE-THIRD the cost! The NEW "TUFFIE" Abrasive Blade, reinforced with steel wire-mesh, cuts new highway slab—ALL "Green Concrete" slab—at unbelievable savings in labor and blade cost. Your dealer has it NOW!

EVEREADY BRIKSAW FOR MASONRY CUTTING

FREE BOOK

FREE BOOK on Masonry cutting . . . requested by more than 18,000 . . . will be sent without obligation . . . or ask your dealer.



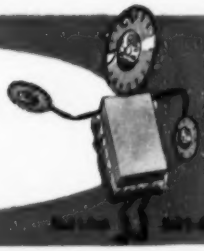
Place blade on either side of saw to cut in corners and confined areas. Blade guard, water hose, and front guide wheel marker assembly are all interchangeable.

EVEREADY DEALERS...

in Most Principal Cities in the United States and Canada

Write for the Name of Your Nearest Dealer.

EVEREADY BRIKSAW CO. ● 1509 S. MICHIGAN BLVD. CHICAGO 5G, ILL.



How to Finance Better Streets

—theme of panel discussion at recent Public Works Congress

TRAFFIC congestion is our Number One public problem, next to war and peace.

This compelling thought by Joseph Barnett was the keynote of an all-afternoon symposium on urban street financing at Atlantic City, where the American Public Works Association held its annual Congress, September 19-22. A high spot in the four-day program of technical meetings and equipment exhibits, the street financing session is reviewed here for the benefit of those not present.

With Glenn C. Richards, commissioner of public works, Detroit, as moderator, the first speaker was J. P. Buckley, chief engineer, Automotive Safety Foundation, Washington, D. C. Speaking on gasoline tax and weight revenues, he gave an over-all picture of existing urban street revenues. National totals for a recent year included $600 million in allocations of state highway users revenues to cities for street purposes, and $400 million from state and federal funds applicable to urban extensions of federal-aid routes.

Noting that the distribution to cities varies widely between the states, Buckley reported for example that Maryland cities get 25% of the state road funds, cities in California 37%, and in Connecticut 41%. Michigan must allocate 40% to cities under the present law, which incidentally is a well-worked-out one based on needs studies made under Mr. Buckley and others. At present only 37% of the states must allocate some part of highway revenues to cities.

Of the $2.5 billion present annual rate of construction investment on the highway system, 16% is for urban extensions. The growing congestion problem of urban areas, where half of all the motor vehicle movement in the Nation takes place, calls for a basic restudy of this financing picture, was the inference left by Mr. Buckley.

Joseph Barnett, assistant deputy commissioner, Bureau of Public Roads, Washington, D. C., reminded the large audience of the growing government interest in urban transportation. The Federal Highway Act of 1954 provides 50% more urban funds than any previous act, including $175 million annually for federal-aid routes in urban areas of over 5,000 population; a portion of the $315 million primary system aid; and a portion of the $175 million yearly for the interstate system. Congress intended that the inter-state funds be used to develop expressway-type facilities.

The Federal Bureau has approved use of funds for urban planning and needs studies, noted Barnett, who observed that expressways are the backbone of every city's traffic planning. Over 200 cities to date have made comprehensive origin-destination studies and many others limited studies with federal help. He said that at last our cities are beginning to make real progress, and that the enlarged federal aid should help solve the urban route problem, which as yet however represents a serious type of bottleneck.

Third speaker was Joseph F. Clark, executive director, Municipal Finance Officers Association, Chicago. Speaking on general tax revenues he noted that in some states the cities are getting a lesser share of the state gasoline tax than formerly. In outlining the tax situation he said that local streets should be financed by local taxation (assessments), and that there is a trend toward the city bearing a part of the cost of certain classes of streets out of general taxation. Of 663 cities surveyed, 456 made such general fund contribution to street work ranging from 25% to 66% of the total street program. Extra widths and intersection improvements should be thus financed in all fairness, he said. But that general tax revenues at times should be used more broadly to speed up a needed program. Another theory is to hold back on taxation and bonding as a revenue source for slack business periods, as an employment aid.

Advantages of Bonding for Urban Highways

Five advantages of bond financing for expressways and other urban highway development were cited by J. P. Buckley of the Automotive Safety Foundation, at the street financing session at Atlantic City:

1. Bond financing permits accelerating construction of high first cost facilities, needed now and offering great economic benefits.

2. Permits development of an integrated system at one time, rather than piecemeal improvements.

3. Street deficiencies may be so acute that needed reconstruction cannot be financed otherwise.

4. Bond financing apportions the tax fairly well in line with user benefits.

Pay-as-you-go financing in many cities will not provide a solution to the traffic problem in the present generation.

Disadvantages of bond financing, also mentioned by Buckley, are that (a) bonds draw interest, (b) bonding power may be needed more urgently for another facility than streets, (c) issuance of bonds may be over-done, i.e., theoretically may encourage over-construction.

Revenue bonds will find only limited application in cities, said Buckley (although Detroit expressways represent a conspicuously successful use of such bonds. Editor).

This speaker also urged that gas taxation be left to the state and federal governments, but that these governments should remember that much of the highway job is urban.

Walter G. Daniel, city engineer, Jacksonville, Fla., concluded the panel by outlining the principles that should be observed in a special assessment program and telling of his city's methods.

In launching a lengthy discussion from the audience, moderator Richards noted that city officials are faced with a sharp stepping up of urban street financing, if they are to take part in the enlarged federal aid program and the big new road push outlined by President Eisenhower. Cities can get nowhere fighting alone for their respective share of funds, but must band together in a federation.

Joseph Barnett in response to a question outlined the procedure for a city to go after matching bigger federal funds. The most important thing, he said is to have a city plan. It is rather shocking, he inferred, that the majority of cities today still do not have a general city plan to work to. Once you have this it is easy to develop an arterial route plan, and then to propose a tangible program in which federal participation can be obtained. Federal funds, he emphasized, are limited by law to approved arterial routes through cities. City leaders should, if necessary, go to the state highway departments and pressure them for cooperation in establishing such routes, since the state highway departments are legally designated as the handling agency.

The Bureau has no real authority to see that any particular city gets its just share of federal aid, due to the lack of a priority set-up. The Bureau has the power to veto but its policy is to avoid being bureaucratic.

"Traditionally we believe in states' rights and in agreements between human beings," said Barnett. "The important thing is to work far enough ahead on a priority program, to insure the orderly development of the highway program."

Speaker Buckley replied to a question on bond financing by saying that "we won't meet the needs ahead if we don't go to bond financing." Bonding is sound for expressways because of the long-term nature of such facilities, 80 to 85% of the cost of which goes for right of way, grading, structures, etc., and relatively little for pavement that will need periodic replacement. We can expect to see more bonding for urban highway work.

What Should a City Do to "Get Going"?

Glenn C. Richards, public works commissioner of Detroit, in moderating the street financing discussion, reported on these pages, recommended the following action to help cities get going on a bigger street program:

1. Help build a strong state league of municipalities.
2. Urge a state-wide study of highway and street needs.
3. Work toward more effective inter-government relations, city-county-state-federal.
4. Mobilize highway user groups into your educational and action program. They pay the bill.

Mr. Richards observed that the city official should not hesitate to urge a state-wide highway needs survey, since it will inevitably point up the critical urban need. "If your state has already made such a study, take steps to see that it is brought up to date."

Coolidge Heads APWA

New officers elected at the American Public Works Association's annual meeting for 1955:

President: Warren A. Coolidge, director of Public works, Nashville, Tenn. (Succeeding Milton Offner of Los Angeles).

Vice-Presidents: Walter M. Sweitlik, commissioner of public works, Milwaukee, Wis.; Albert G. Wyler, director of streets, New Orleans, La.

Treasurer: Robert L. Anderson, superintendent of public works, Winnetka, Ill.

Directors - at - large: W. D. Hurst, city engineer, Winnipeg, Canada; Roy W. McLeese, city engineer, Salt Lake City, Utah; Raymond A. Williams, assistant city manager, Miami, Florida.

Continuing on the Association's Board of Directors: Kenneth K. King, director of public works, Phoenix, Arizona (vice-president); Edward P. Decher, secretary, Joint Sewer Commission, Newark, N. J. (vice-president); Frederick W. Crane, manager, Buffalo, (N. Y). Sewer Authority (director-at-large).

AED to help cut government paper work

Associated Equipment Distributors, at the request of the Hoover Commission, recently helped launch a comprehensive study designed to reduce governmental paper work. Five AED members met in Washington recently with industrial and farm equipment leaders, forming a special committee to recommend means of simplifying reports and otherwise relieving business and industry from the mountains of paper work now required by Federal agencies.

Subjects discussed included Internal Revenue quarterly withholding and annual recapitulation statements; monthly Department of Commerce reports; Census surveys; Federal Reserve Bank records; employment survey results required by the Department of Labor; and Federal Trade Commission reports. Also examined were records required by the Labor Department's Wage and Hour Division, the Securities and Exchange Commission, and the Renegotiation Board; likewise the recently-proposed postal size and weight limitations.

Committee members were asked to study government reports affecting their own businesses and to confer with other businessmen in the construction, farm and industrial equipment industries, seeking their suggestions.

A second and final meeting of the committee was scheduled in Washington on October 27. At this time recommendations will be drafted for submission to the Hoover Commission.

● Borrowing power of the 48 states for highway construction is the subject of a study just completed by the National Highway Users Conference. NHUC finds that 39 states may soon incur debt for highway purposes, although all but 12 of that number are limited by their constitutions in the amount they can borrow.

● Over 366 miles of the New York Thruway will be open to traffic with the addition of 183 miles formally opened late in October between West Moreland and Newburg in upstate New York.

1 OK boys, let's try a straight cable pull with the D8. Maybe we won't have to shoot it.

How Would You Do It?

One of a Series

SCENE: West Virginia Turnpike, Contract 32. Time, early 1954.

CONTRACTOR: Tyler-Breslin Quarries.

PROBLEM: A shanty-size boulder is partly loosened in the bank. Dozer on hand to clean coal off the ledge floor ahead of the drill rig, but with nothing to do at the moment. Shovel working 50 ft. below. That big one might roll down on the drill when the rig gets alongside. **What should we do?**

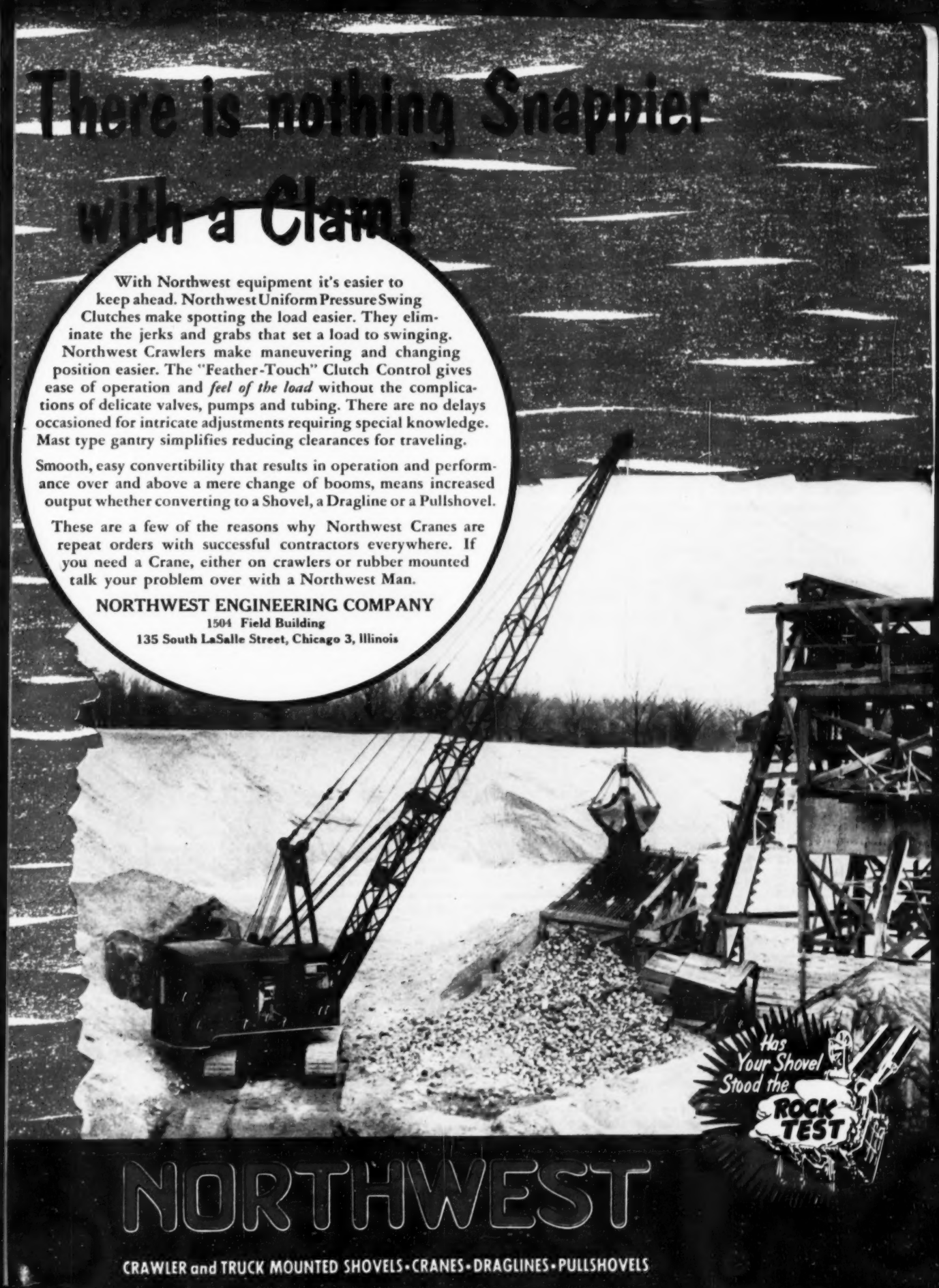
Dozer Operator Battles Big Ledge Rock

2 Cable broke. So we'll try undercutting the critter just a little. Go easy, brother — she's a big one!

3 Another try with the cable. This time why not try loosening this little one. Might start the big one (above) to tumbling.

4 We'll pull in this direction. Loosening this small one ought to do it. Note friction smoke around rock. ▼

5 Three broken cables and three tries later — down she comes (while the cameraman was napping). Now we can drill and shoot it safely before making the next ledge blast. ▶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Letters to the Editor

To the Editor:

Reference is made to Mr. L. E. Schumacher's article "How the Right Equipment Application Affects Your Earthmoving Costs" in the June, 1954, issue of ROADS AND STREETS.

Chart No. 1, on page 69, is entitled "Highway Excavation Trend Compared to ENR Cost Index," whereas it actually shows a comparison between the Bureau of Public Roads composite bid price trend and the Bureau of Public Roads excavation bid price trend.

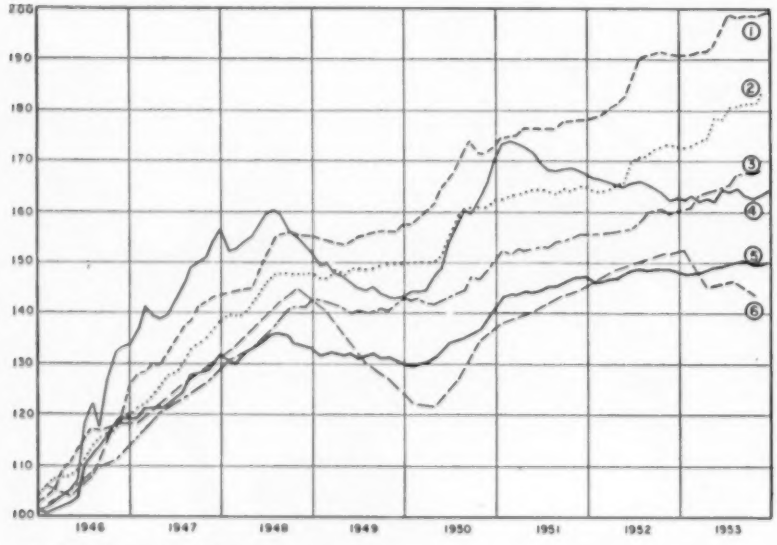
It is believed that a comparison between the excavation trend and the Engineering News-Record Construction Cost Index would have depicted more clearly what Mr. Schumacher intended, since the Engineering News-Record Index is a composite trend of labor and material costs while the Public Roads Indexes are bid price trends.

The article states that Chart No. 1 is a modification of one published by Engineering News-Record on October 15, 1953. The chart referred to actually appeared in Engineering News-Record of October 8, 1953.

The reader may be interested in "Price Trends for Federal-Aid Highway Construction" for the first quarter of 1954 and "Comparisons of Various Prices Indexes on 1945 Base" on which the Bureau of Public Roads Price Index (Composite Mile) and the Engineering News-Record Construction Cost Index are identified for ready reference. We found Mr. Schumacher's article constructively interesting.

A. C. Clark,
Deputy Commissioner,
Bureau of Public Roads,
Washington, D.C.

The chart referred to in the last paragraph is published on this page. Thank you, Commissioner Clark, for this clarification. — Editor.



● How the various index curves compare.

1. E.N.R. Index — 17% struct. steel, 4% cement, 22% lumber, 57% common labor.
2. A.G.C. Index — 40% labor (common), 60% materials (15% aggregates, 15% cement, 15% lumber, 7.5% hollow tile, 7.5% steel).
3. Composite Index (labor and materials) — 40% labor, 60% materials.
4. B.L.S. Wholesale Index — farm products, foods, hides and leather products, textile products, fuel and lighting materials, metal and metal products, building materials, chemical and allied products, house furnishing goods, miscellaneous (total approx. 900 commodities).
5. B.L.S. Consumers Index — food, apparel, rent, fuel, electricity, refrigeration, house furnishings, miscellaneous (total approx. 200 items).
6. B.P.R. Composite Mile Index — 17,491 c.y. excavation, 3,726 s.y. paving, 16,000 lb. reinf. steel, 4,325 lbs. struct. steel, 68 c.y. struct. concrete.

(B.P.R. = Bureau of Public Roads; B.L.S. = Bureau of Labor Statistics; E.N.R. = Engineering News-Record; A.G.C. = Associated General Contractors of America).

To the Editor:

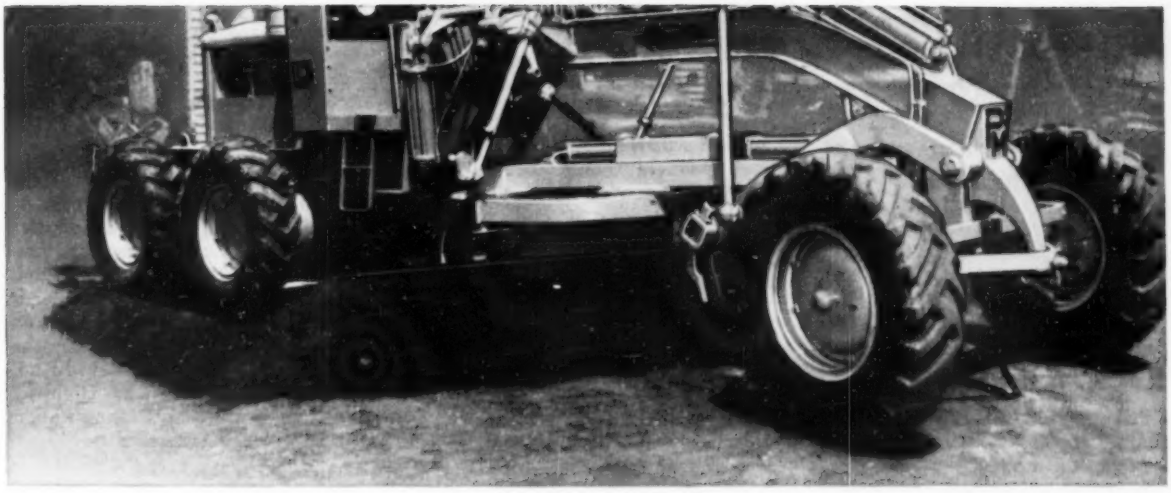
Mr. White's letter (See "Letters," ROADS AND STREETS, October, 1954, page 69), bearing on the needs in many modern drying operations for dust control equipment which fits the particular project, is a welcome addition to my remarks on this matter of dryers. I did not get into dust control, feeling that such equipment is considered an extra in many plants, although I think we are rapidly approaching the point where dust control will be mandatory (if not regulatory) for both good will and economic reasons. Mr. White's letter makes the necessary points.

It is interesting to note that this matter of dust control emphasizes the principles of my discussion. The dust equipment should be obviously designed for the purpose in the same way as the dryer and mixing sections of the plant should suit the particular requirements. It is clear that throughout the highway field specific study and consideration on each job are becoming more and more essential, whether it be on the design and specifications or in the doing of the work by the contractor. And such plans and decisions are essentially the functions of the engineer, whether or not you wish to give this title to the man responsible for them. Design and construction by arbitrary rules is getting less and less desirable. It cannot stand up against the competition of the individual approach of competent and well grounded men.

— H. G. Nevitt

● Alaska's highway needs are being surveyed by the U. S. Department of Interior. The adequacy of existing roads and operations of the Alaska Road Commission will be reviewed by a team consisting of George Goodrick of the Interior Department, Oregon state highway commissioner, Charle H. Reynolds and Oregon assistant state highway engineer W. C. Williams.

● Radio remote control of stop-and-go traffic lights to move efficiently and meet emergencies has been proposed in Chicago. Lights in a system would respond to certain conditions including weather instead of changing on rigid time cycles.



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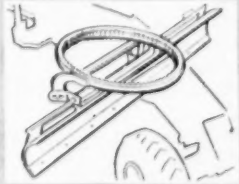

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New Publications

ASTM standards on cement

The 1954 compilation of ASTM Standards on Cement (with related information) brings together in compact, readily usable form, the ASTM test methods, specifications, and definitions widely used in this field. Prepared by ASTM Committee C-1 on Cement, this edition gives in latest form 34 ASTM standards, including 23 test methods; 9 specifications; and 2 definitions: one for the term addition as applied to hydraulic cement, the other for the term pozzolan.

Chemical and physical test methods cover: portland cement — autoclave expansion; calcium sulfate; chemical analysis; fineness; heat of hydration; sodium oxide and potassium oxide. Also included are test methods for: hydraulic cement — air content; chemical resistance; compressive strength; fineness; mechanical mixing; normal consistency; sampling; soundness; specific gravity; tensile strength; time of setting and flow table.

This new edition embodies numerous revisions of existing tests and specifications and includes a new method of test for mechanical mixing of hydraulic cement mortars of plastic consistency. In this special compilation 19 of the standards included in the previous edition have been revised, of this number, 10 are methods of test, 7 are specifications, and 2 are definitions.

Copies of this 254-page book, in heavy paper cover, can be obtained from Headquarters of the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa., at $2.75 each.

One-way street study report issued

Increasing use of one-way streets is going far toward easing downtown traffic jams, reducing accidents and boosting business, the Chamber of Commerce of the United States reports on the basis of a 134-community survey.

While merchants usually are skeptical at the time a one-way plan is first proposed, only nine of the 134 communities returned a part or all of their one-way streets to two-way use, the survey shows. After a trial period, businessmen generally agree that the advantages of one-way streets in congested areas outweigh the disadvantages.

Most of the communities studied showed a sharp increase in the volume and speed of traffic when two-way streets were converted to one-way use, while both pedestrian and vehicular accidents were reduced. Sacramento, California, reported a 35 per cent increase in traffic volumes, a 62 per cent reduction in pedestrian accidents and a 23 per cent cut in accident frequency, after establishing one-way streets in the central area. New York City reduced average motor vehicle running time 33 per cent on First and Second Avenues by making these arteries one-way.

Entitled *One-Way Business Streets*, the study is intended to help businessmen and city officials who are considering conversion of downtown streets to one-way use. It provides concise information on effects of one-way streets on retail sales, property values and traffic control and outlines the steps necessary for success of a one-way plan. The booklet is available at the Transportation and Communication Department of the National Chamber, 1615 H Street, N.W., Washington 6, D.C. Single copies are free, additional copies, 25 cents.

Prestressed concrete bibliography

The American Concrete Institute announces publication of BIBLIOGRAPHY OF PRESTRESSED CONCRETE. This 86-page book lists 2,000 American and foreign literature references on the subject of prestressed concrete, published 1896 through 1953. A separate section lists some 60 United States, British, German, and French patents. The 8½ x 11-in. format is also punched for easy filing in three-ring binders. Price — $2.00.

The book was prepared as a part of the work of ACI-ASCE Committee 323, Prestressed Reinforced Concrete.

DESIGN OF FLEXIBLE PAVEMENTS. Research Report 16-B 77 pages. Consists of six papers and discussions under committee on flexible pavement design, A. C. Benkelman, chairman, presented at the 33rd Annual Meeting of the Highway Research Board, January, 1954. For copy address The Board at 2101 Constitution Avenue, Washington, D. C.

PROCEEDINGS OF 12TH SHORT COURSE ON ROADSIDE DEVELOPMENT, Ohio State University and Ohio Department of Highways. 125 pages covering many technical papers. For copy address Wilbur J. Garmhausen, Chief Land Architect, Ohio Department of Highways, Columbus 15, Ohio.

THE WASHO ROAD TEST — PART 1; DESIGN, CONSTRUCTION, AND TESTING PROCEDURES. Special Report No. 18 embodying voluminous data presented at the 32nd annual meeting of the Highway Research Board January, 1953. This report is the first of two final reports planned for the Washo Road Test at Malad, Idaho. Price $2.25. Address The Highway Research Board, 2101 Constitution Ave., Washington 25, D.C.

SCIENTIFIC INSTRUMENTS MADE IN GERMANY. Published in English at the request of the German-American Trade Promotion Office, Cologne, Germany. This compilation includes numerous items of possible interest to engineers and contractors.

Available upon request to German-American Trade Promotion Office, Empire State Bldg., Suite 6921, 350 Fifth Avenue, New York 19, New York.

STRUCTURAL DESIGN IN REINFORCED CONCRETE. By Clifford D. Williams, consulting engineer, Patchen & Zimmerman, Engineers; and Charles E. Cutts, associate professor of civil engineering, University of Florida. Textbook intended for civil engineering and architectural students in the basic study of reinforced concrete design. 308 pages. Price $6.00. The Ronald Press Co., 15 East 26th St., New York 10, New York.

FIELD PRACTICE; DATA BOOK FOR CIVIL ENGINEERS. By Elwyn E. Seelye. 394 pages. Price: $7.50. John Wiley etc. Sons, Inc., 440 4th Avenue, New York 16, New York.

This volume, number three in a series which embodies a volume on design and one on specifications, is an extensively revised and enlarged second edition. It includes a special reference section on surveying and a unique, simple approach to the modern theory of soil mechanics entitled "Soil Behavior."

STABILIZED TURF SHOULDERS. Special Report 19, concluding report of a special task committee in the subject, and covering papers presented at the 33rd Annual Meeting, Jan., 1954. Available at price 30 cents. Address The Highway Research Board, 2101 Constitution Ave., Washington, D.C.

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If your trucks have a double function—operation on and off the highway—it will pay you to look into the big advantages offered by B Series Macks . . . the first completely new line of heavy-duty trucks offered by any manufacturer since World War II.

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Mack B-61S six-wheel dump truck, one of 26 Macks owned by A. H. Ferber, Jr., Green Village, N. J., shown working on construction of New Jersey's Garden State Parkway.

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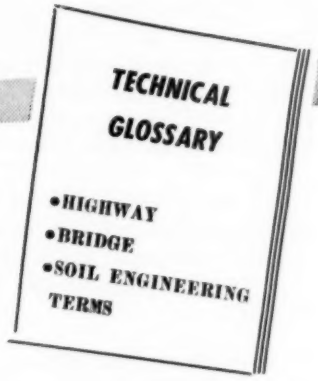

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TECHNICAL GLOSSARY is a much needed work for use in translating English technical material into Spanish, or Spanish technical material into English, in order to convey the exact same idea and meaning to the reader of either language.

THIS BOOK has been in process of preparation for a period of fifteen years. When it comes off the press the preparation cost will be in excess of $45,000.

The need of a specific glossary or dictionary of terms of this type has long been felt. After several International conferences between representatives of the U. S. Bureau of Public Roads and Latin American engineers, a decision was reached to prepare such a glossary. To further extend its usefulness, soil stabilization and associated laboratory work was included.

The manuscript for this book of over 35,000 terms was over 15 years in preparation under E. W. James, then Chief, Inter-American Regional Office, U. S. Bureau of Public Roads, working with the Library of Congress of the United States. It has been approved by a committee of five bilingual engineers of the Mexican government under the chairmanship of Sr. Ing. J. Fco. Rodríguez Cabo. It was then submitted to and approved by the "Academia Mexicana Correspondiente de la Academia Real Española" under the chairmanship of Sr. Don Martín Luis Guzmán, distinguished author, editor and publicist, also publisher of "El Tiempo."

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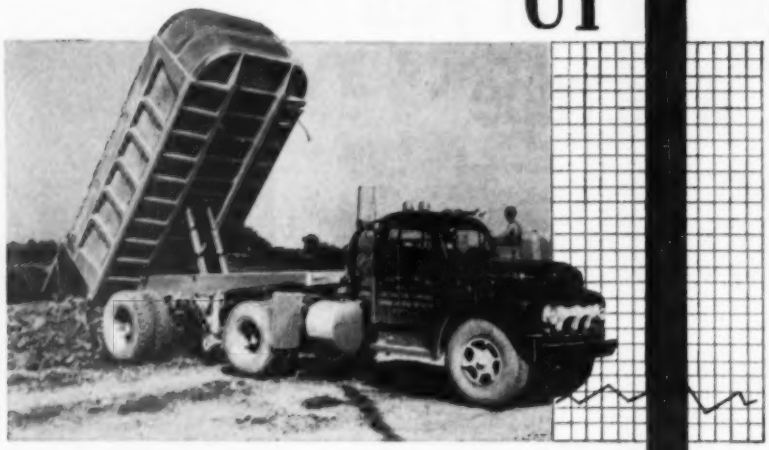

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More and more, owners are finding their MARION dump trailers are "built to take it." The "proof of the pudding" is in repeat business and additional sales. Why? The extra attention given every job . . . the experience and pride in workmanship . . . the highest quality materials used . . . guaranteed performance and service . . . tells the story.

Marion all-welded trailer bodies are constructed to minimize sagging or twisting when loads are uneven or extra heavy.

Marion Telescopic hoists are made of heavy, seamless steel tubing polished to a mirror-like finish to greatly reduce wear. The jacks are connected to the frame in such a way as to prevent binding. They are designed to give equalized lifting power, regardless of the load. Stability is maintained by rigid underbody construction.

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A complete line of standard and special Hydraulic Hoists and Dump Bodies To Fit Every Need

Personals

Paul F. Rice new ACI technical director

Expansion of services of the American Concrete Institute to its members is forecast by the appointment of PAUL F. RICE as Technical Director. Mr. Rice's duties include field and office work to promote and improve technical relations with other societies and organizations, assist member groups in organizing and conducting technical meetings, and aid technical committees in the preparation of reports.

Mr. Rice, a North Dakota State graduate, received his M.S. in civil engineering at MIT and the University of Michigan. He is a Registered Professional (Civil) Engineer, with experience in designing, estimating, inspection and laboratory testing with American Bridge Co., Gary; Thompson & Lichtner Co., Inc., Boston; Cunningham-Limp Co., general contractors, Detroit; and Mellon Steel Fabricating Co., Detroit. He served 39 months as an aviation engineer officer during World War II with responsibilities for paving, building construction, labor and supply procurement, and earthmoving. Most recently he was for five years structural field engineer, Michigan District, Portland Cement Assn.

Glenn Richards advanced

GLENN C. RICHARDS, recent Superintendent of Public Works of Detroit, has been named Director. Richards in turn has appointed Milton Wagnitz, City Engineer of Detroit, succeeding George R. Thompson who retired recently.

Richards, who has long served Detroit in the Public Works Department and as expressway coordinator, has been an active leader in the American Public Works Association and other national organizations. Richards, Thompson and Wagnitz are all veterans in the Detroit public service.

JOHN H. MULLEN has been appointed a full time consultant on the staff of the Associated General Contractors of Minnesota, Inc. Mr. Mullen was formerly president of Nelson, Mullen & Nelson, Inc., having retired from active business recently. Earlier Mr. Mullen made national fame as chief engineer during the 20's when the Minnesota state highway department undertook its first big program.

BEFORE mowing with the Dearborn Rotary Cutter, heavy undergrowth and small brush grew thickly in this park area.

DURING mowing, the Dearborn Rotary Cutter moved swiftly and surely through this dense area without stopping.

AFTER one pass with the Dearborn Rotary Cutter, brush and weeds were cut, shredded and scattered—a clean path was made.

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The Dearborn Rotary Cutter mows a full 5-foot swath—adjusts to a positive cutting height from 2 to 10 inches. And, since it attaches to the Ford Tractor's 3-point hitch, it mows *behind* the tractor rather than to the side—mows wherever the tractor goes.

Priced exceptionally low to start with, the Dearborn Rotary Cutter and Ford Tractor cost far less to maintain. Both are ruggedly built for years of hard service. The cutter is power-driven through a heavy-duty gear box—no belts to replace. The blade is hinged and folds back when an obstruction is hit. And, best of all, there are no sickle bars to buy! Ask your nearby Ford Tractor and Equipment Dealer for a demonstration or write to the address below.

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Dearborn EQUIPMENT

This amazing view of the heaviest construction area on the Ohio Turnpike emphasizes the wide range of Flex-Plane mechanical bridge finishing from the 2600′ Cuyahoga River crossing (top) to the small 100′ exit ramps (bottom).

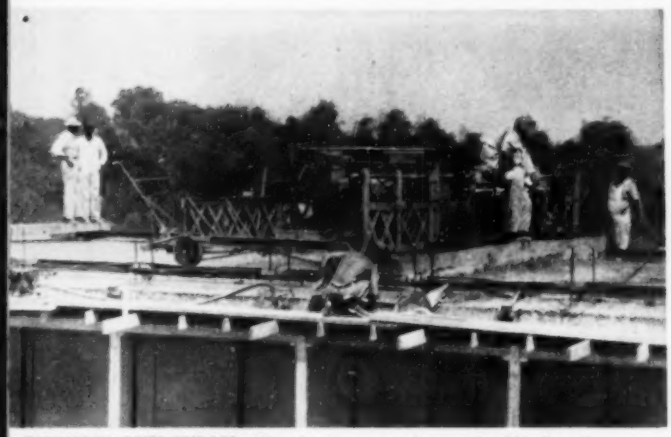
1. **Largest Bridge on Ohio Turnpike** spans Cuyahoga River south of Cleveland. It is 2682′ 3″ bearing to bearing of abutments. Slab was mechanically finished by Flex-Plane Finishing Machines.
2. **Largest Fill on Ohio Turnpike.** 106 feet deep it required 1,600,000 yards of fill dirt.
3. **Railroad Bridge** carrying the New York Central across the Turnpike.
4. **Deepest Cut on Ohio Turnpike.** The cut was made through solid sandstone 85′ in depth. More than a million and a half yards of stone were removed.
5. **Arch Span Bridge** (282′) carrying old State Route 8 across the deep cut.
6. **Small Bridge** of the many that were mechanically finished is this 181′ overpass. Flex-Plane finishing Machine can be seen at work on the ramp.
7. **Relocated Route 8 Bridge.** Double span will carry divided highway over Turnpike. West bridge will also carry deceleration lane for Turnpike entrance.
8. **Turnpike Overpass** (206′) is typical of the smaller bridges that are being mechanically finished by Flex-Plane Bridge Finishing Equipment.

The Machine that couldn't be built • Was!

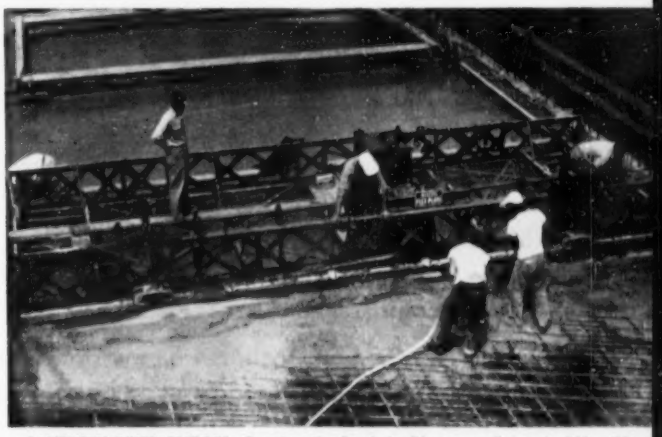
MECHANICAL BRIDGE SLAB FINISHING ON OHIO TURNPIKE PAYS DIVIDENDS

One construction firm, awarded a contract for building a piece of the Ohio Turnpike, heatedly questioned the ability of machine manufacturers to build a machine that was practical for finishing bridge slab according to the terms of the contract.

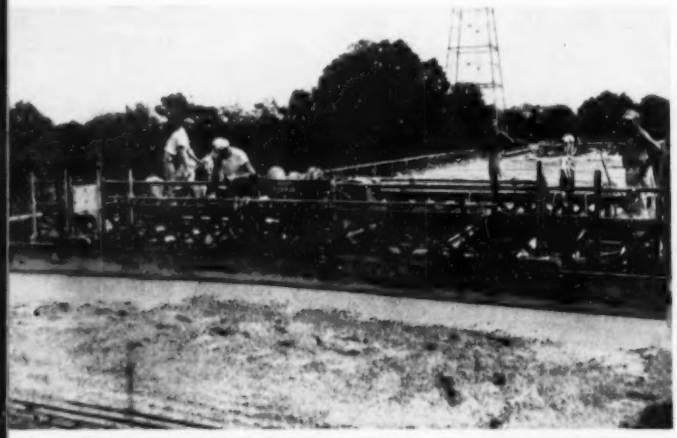
Some machine manufacturers themselves were doubtful. However, the Flexible Road Joint Machine Co., a recognized leader in the development of machinery for concrete finishing (Triborough Bridge — Pennsylvania Turnpike — etc.), set its engineers to work adapting its already successful bridge finishing machine to Turnpike specifications. The pictures below attest to the success. Not only are all the major and most of the minor bridges on the Turnpike being machine finished, but many of the secondary road over passes, where a concrete base will be topped with asphalt, are being constructed in this manner. Initial reports are tremendous. Greater uniformity, exceptional speed, beautiful riding quality, and, best of all, much less expensive.



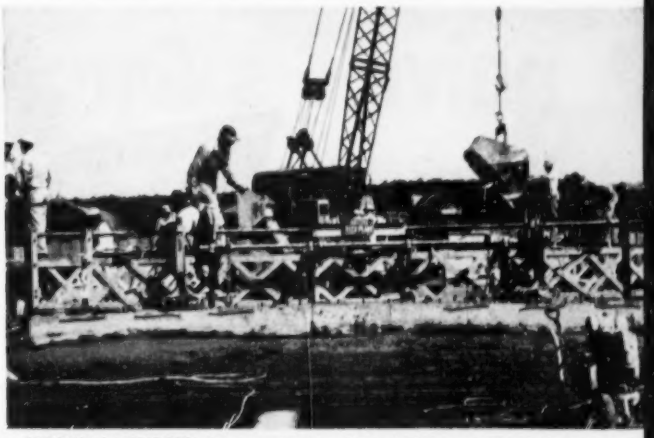
CUYAHOGA RIVER BRIDGES—All major stream crossings on the Ohio Turnpike are of dual construction. Actually two bridges—one for each direction of traffic. The Cuyahoga crossing is the longest—2682 feet. They were completely machine finished with two Flex-Plane Portable Bridge and Elevated Highway Finishing Machines. Note pneumatic rubber tired wheels in frame of machine. They are hydraulically dropped and machine becomes a trailer—easily and quickly towed anywhere along the job.



SANDUSKY RIVER BRIDGES—Crossing the Sandusky River near Fremont, Ohio, this pair of bridges is 915 feet in length. Flex-Plane Bridge and Elevated Highway Finishing Machine was used on these bridges. Actually only one operator is required to run finisher.
Note how concrete rolls in front of screed. It is not scraped or pushed. Machine leaves an extra smooth slab behind that requires a minimum of hand labor. Men in the foreground are tamping concrete through mesh.



MAUMEE RIVER BRIDGES—Note second bridge in left background. Flex-Plane Standard machine used here easily keeps pace while making a double run over slab surface. Although Turnpike bridges are standard width (30 feet) Flex-Plane Machine is telescopic and can be made to span extra-wide or extra-narrow slabs.



SECONDARY BRIDGES—Many construction firms, having experienced the ease and economy of machine finishing of bridges and elevated roadways, found they could effect savings even on the smaller ramp bridges at Turnpike entries and secondary roads. Above Flex-Plane machine is finishing overpass that is but 206 feet in length. Same machine effected savings on a 181 foot ramp in same area.

Flex-Plane Finishing Machines have played roles in the finishing of roadways and bridges on the large concrete highway projects of the past decade. Flex-Plane engineers are experts in designing equipment for modern highway finishing. Why not bring yourself up-to-date by getting your copies of Bulletins N-14 (Bridge Finishing) and P-111 (Highway Finishing).

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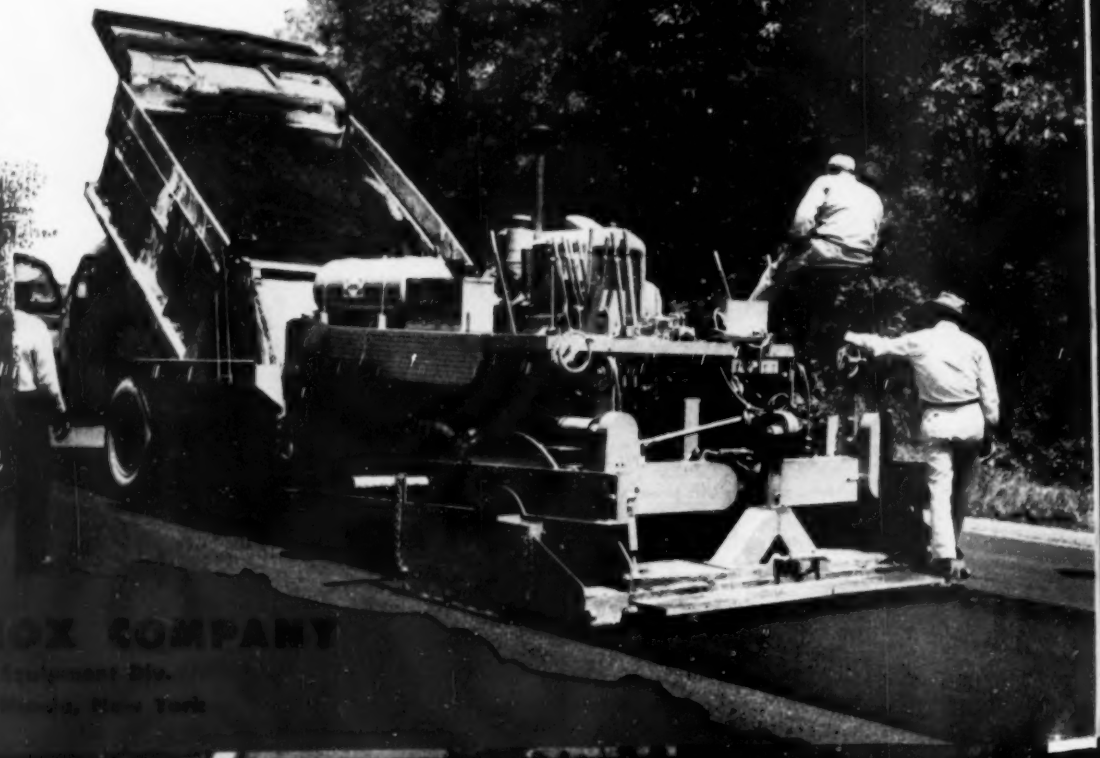
Bituminous Paver

APPROVED

The approval of the Blaw-Knox Bituminous Paver by the Highway Department of the Commonwealth of Pennsylvania should have real significance to contractors considering the purchase of new asphalt finishing equipment. The State of Pennsylvania is particular about how its roads are laid and the approval of the Blaw-Knox Paver came only after the laying and examination of many miles of road in the Pittsburgh area.

Contractors who plan to buy a new asphalt paver should give serious thought to the savings made possible by wheel operation. The Blaw-Knox Bituminous Paver gives *a better surface at higher speed.* Its mobility cuts relocation time and truck waiting time. Its more simple design *materially* reduces upkeep cost. Don't buy a Bituminous Paver until you have the whole story on the Blaw-Knox.



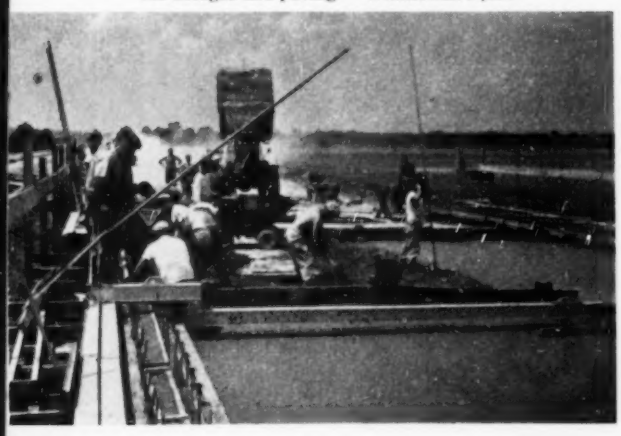
On wheels it will pave for less

BLAW-KNOX COMPANY

● "Two of everything, and nothing backs up!" The Holderman firm which has this slogan, here uses one Jaeger spreader, two Jaeger finishers, and two speeded-up Koehring longitudinal floats back of rear paver.

New Ideas Help Contractors Speed Ohio Turnpike Paving

● Non-agitating Dumpcrete concrete delivery for bridges and paving—Winkleman's job.



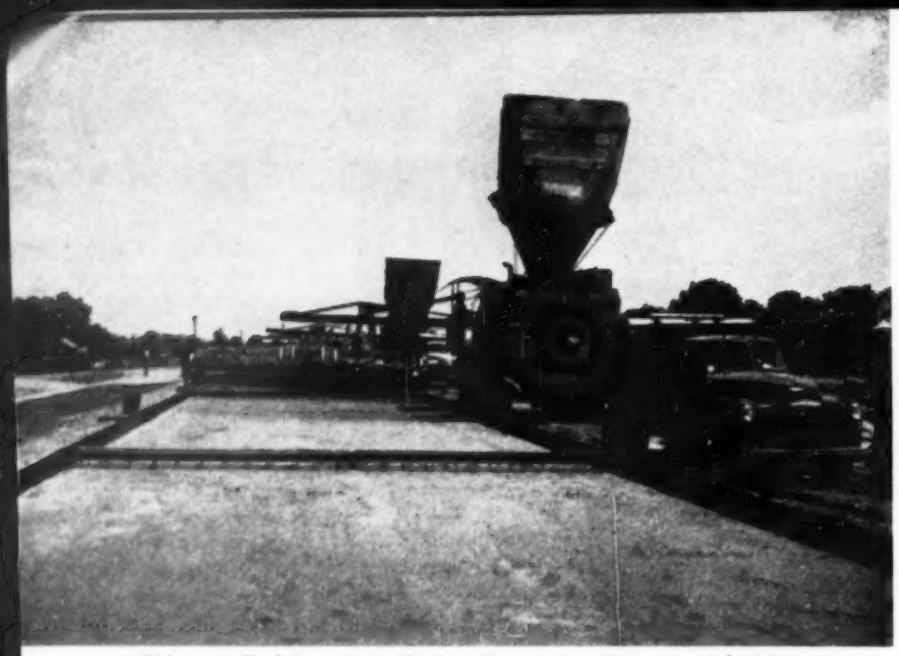
Novel as well as standard methods and equipment were used by the contractors in paving 80 miles of the 241-mile Ohio Turnpike Project No. 1 during 1954.

THE FELLOW who said that all concrete paving jobs today tend to be alike, could have seen many new ideas on the Ohio Turnpike in recent months.

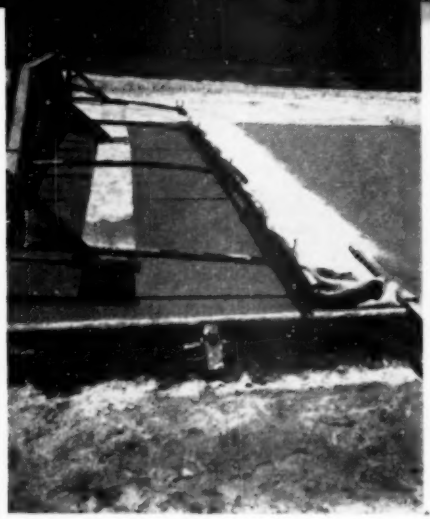
For example the Holderman firm worked a novel paver sequence, and had "two of everything" behind the pavers. Their best day of 7,015 lin. ft. of 10 in. x 12 ft. lane (in 13 hours) is quite a record.

And Winkleman's unique set-up made history with a cen-

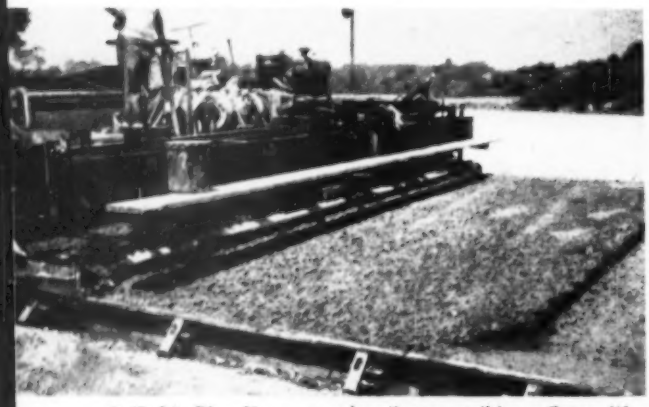
A ROADS AND STREETS STAFF FIELD REPORT



● Using two Koehring pavers, Harrison Construction Company paved 24 ft. wide using largely standard methods.



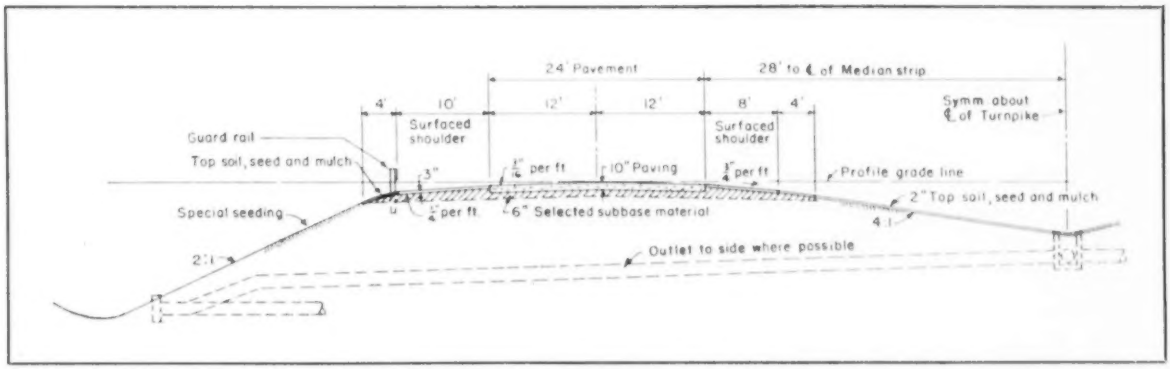
● Burlap drag attachment on back of a converted joint machine. Harrison firm devised this labor saver.



● (Left) Blaw-Knox spreader-vibrator striking off top lift on Harrison's C-1 project. (Right) Harrison used two Blaw-Knox finishers, each with two screeds.

With Harrison Construction Co. on Contract C-1

● (Left) Another of Harrison's job speeding tricks; portable wooden bridges for batch trucks, spotted by a tractor from point to point across the depressed median. (Right) Rolls of paper curing mats were towed by a LeRoi Tractaire.



● Standard cross section of Ohio Turnpike pavement and roadway on fill.

tral concrete plant and non-agitating truck delivery — an effective method of flexibly synchronizing paving with structural concrete work.

Or take Harrison's job, where so-called standard and familiar equipment produced efficiently, aided by such minor labor-saving tricks as skid-mounted truck bridges over the depressed median, and a special mounting for the burlap drag.

Some of the details on these three selected contracts will be described following a brief review of the turnpike pavement design and specifications. Sixteen contractors had begun paving by early autumn, reaching a combined daily pace of 100,000 sq. yd. or more. About 80 miles will be paved this year.

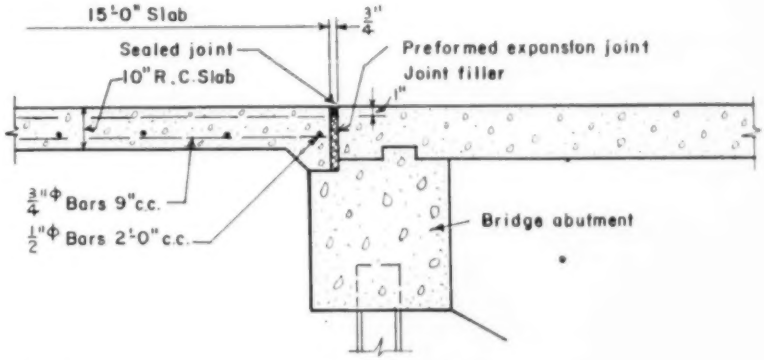
This is the pavement which, readers will recall, made headlines in 1953 when the courts gave the turnpike commission an OK on selecting paving type on judgement rather than price. The pavement system for each of the dual 2-lane roadways consists of 10 in. x 24 ft. reinforced concrete on a granular subbase extending the full grade width.

Subbase. The subbase with a minimum of 6 in. depth under the pavement is required to be of stone, slag, gravel or blended material designed to give a stable, frost resistant roadbed. Gradations limits are as tabulated.

Sieve	*Total % passing*
3 inches	100
½ inches	70-100
¾ inches	40-100
No. 10	20-75
No. 40	10-35
No. 200	0-15

The fraction passing No. 40 is required to have a Plasticity Index of not more than 3 and a Liquid Limit of not more than 30, and clay content is limited to 3% by weight of the material. Density is prescribed in lb. per cu. ft., depending on the maximum lab dry weight. Compaction methods are left to the contractor.

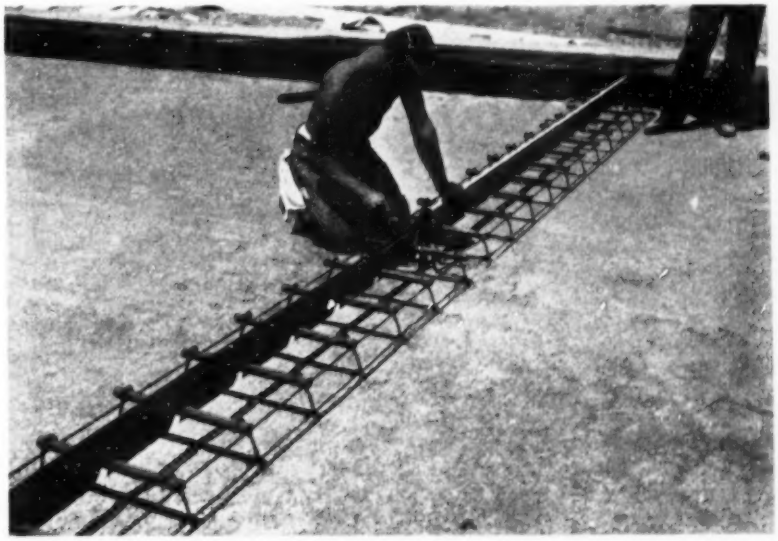
Granulated slag has been used extensively as subbase material on the eastern part of the turnpike, reportedly making an excellent base and a material easy to handle. (A separate brief report will be published on it.)



● Details of reinforced pavement slab at bridge ends.

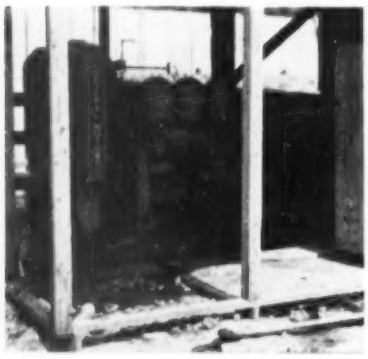
Aggregates. While crushed limestone is being used in the western end, and gravel in the central turnpike zone, a noteworthy feature is the extensive use of air-cooled crushed and screened slag as course aggregate (Ohio sizes 3 and 4) on contracts to the east. Huge tonnages have figured in seventeen job sections for paving and structures. Also for macadam shoulders on eleven of the 62 turnpike sections; and for access road new construction or widening with water-bound base and bituminous topping.

Crown. The pavement surface slopes laterally on tangent from either side of the centerline, except that a



● One of three alternate types of dowel assemblies specified at contraction joints.

● Most-talked-of innovation on the turnpike paving was Winkelman's use of Ford mounted Maxon Dumpcrete units for non-agitating delivery of concrete to the grade.



● General Motors Diesel engines — a pair of them — generated electric motor power for the central mixing plant.

Pictures on These Pages Show

6-ft. rounding is permitted at the center in connection with 24-ft. pours. Of 15 jobs tallied by this reporter to date five are single-lane, ten are full-width.

Distributed Reinforcement. Alternates permit either 612-04 welded wire mesh, or welded bar mats consisting of ⅝ in. longitudinal bars at 7 in. spacing with ⅝ in. tie bars every 4 ft. All contractors to date elected to use the mesh. Mats are placed on the first spreader lift, not to exceed 4 in. below top of pavement.

At bridge ends a 15-ft. special slab design includes closely spaced ⅝-in. bars in the axis direction, the slab resting on the bridge seat to insure against uneven settlement.

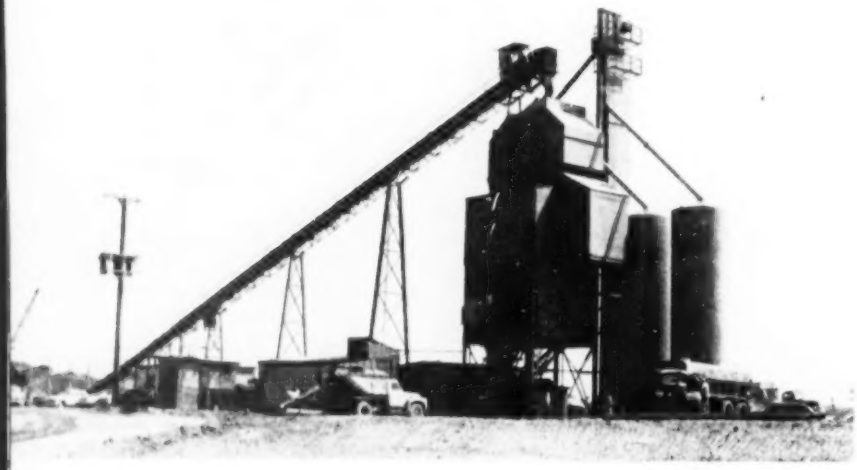
Joints. Doweled contraction joints at 61½ ft. intervals are required to be formed and not sawed. Three alternate types of joint assemblies (Bethlehem, American Steel & Wire and Doweld) are permitted, each finding favor with one or more contractors. As is described under "Spreading and Finishing", the turnpike engineers have placed great stress on careful workmanship in removal of the steel cap so that the prescribed ¾ in. x 1 in. groove will be accurately made and the embedded partial division plate fully exposed before sealing.

Centerline or lane joints are keyed and tied where pavement is placed one lane at a time. When placement is 24 ft. wide the contractors may form or saw the center joint, and have used the sawing method on all job sections to date.

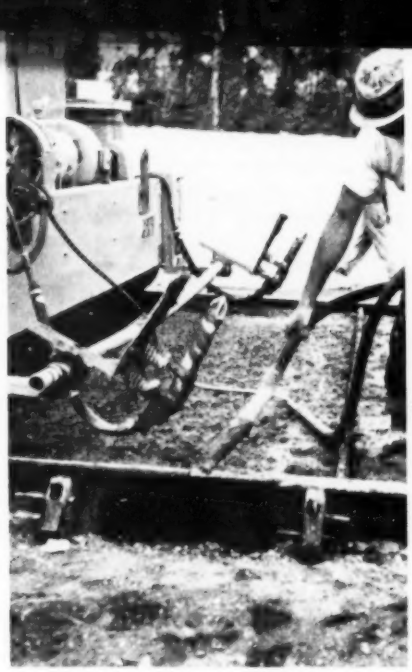
Another alternate offered the contractor is the choice of hot or cold rubber asphalt seal. Cold rubber has been used on all jobs.

Spreading and Finishing. Both the strike-off for setting mesh and the spreading and finishing of the final surface are specified in detail, with special attention to getting a homogeneous concrete around joint assemblies and avoiding disturbance of the accurately positioned joints.

A 4 to 10 in. roll of concrete in front of the spreader is mandatory throughout all spreader progress, except in approaching a joint the spreader must be stopped and the roll cleared away. The front screed is then lifted, the machine started, and



● The Winkelman concrete plant consisting of two Koehring 2-yd. mixers with Johnson cement bins and Barber-Greene belts.



● (Left) Another type of vibrator — Maginniss equipment mounted on the first strike-off machine. (Right) A Heltzel hydraulic finisher was part of Winkelman's equipment. Note neat roll of mortar on final finishing pass.

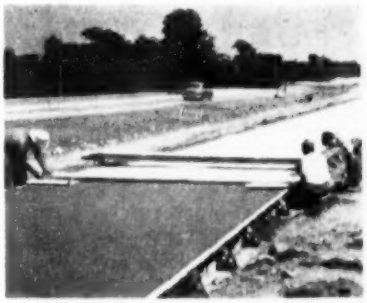
Winkelman's Central Plant and Non-Agitating Delivery

the screed set down directly over the joint and the screeding continued. Before the second screed is near enough to cause excess mortar to flow over the joint, this screed likewise is lifted over the joint. Concrete is then carefully placed around the joint. Excess mortar near the joint is spread with shovels to avoid mortar pockets. The screeds may not need to be lifted for the second finishing pass, provided no coarse aggregate is deposited over the joint or immediately between it and the screed. A longitudinal as well as transverse finisher is required.

The final texture must be formed by dragging a canvas belt or burlap drag straight ahead. Any method which forms grooves deeper than 1/16 in. is prohibited.

Vibration. The specifications permit the contractor to use vibration or not, the mix being designed according to the method he adopts for the project. Slump is specified at 1-1½ in. for vibration placement, 2-3 in. otherwise. Vibrator equipment when used is mounted on the first spreader. Some contractors have mounted spud-type vibrator units. Others have used spreaders (Blaw-Knox) having a vibratory rear screed. In some instances the vibrator bar on the latter has been dampened or vibrators used only when the mix is especially dry.

Curing. Paper or water curing is mandatory on the turnpike; all contractors are using paper. The specifications are quite detailed on the make-up of paper mats, which must consist of 100% sulphate Kraft paper sheets, fiber reinforced and cemented together with bituminous material. Paper must meet ASTM test designation C 156, assuring waterproofness. White color is required. Sheets are to be sewn into blankets 30 to 75 ft. long and carefully rolled up on poles for transporting. Stringer sheets laid along the edges under the main paper are available for pulling down over pavement sides and anchoring by earth backfill. The turnpike concrete



● Curing paper being unrolled in accordance with exacting specifications.

● Cleaning up the Dumpcrete bodies after a day's run — performed at a station near the concrete plant, aided by hose lines mounted on pipe standards between truck stations.

● Blaw-Knox base finisher spreading stone screenings for subbase on Holderman contract.

thus is assured positive curing, as one of the many procedures to secure a durable and strong pavement.

An interesting management trend has been the subbing of the curing, joint sealing and form handling on fourteen of the contract sections to a single specialist organization, Pavement Controls, Inc., of Cleveland.

Batch Control. A controversial feature of the original specifications was the requirement for weigh batching. One detail, later eliminated, was the use of automatic graphic recorders, capable of being locked and of recording the weight of each ingredient of each batch, identifying all batch details on the graph and recording the moisture compensation.

Present specifications permit either a single scale for all aggregates or a separate scale for each aggregate, plus a separate cement scale, with interlock to prevent opening of the hopper inlet gate when the discharge gate is open. Cut-off gates for cement and aggregate batching for pavement concrete must be automatic and controlled by the scale mechanism. Cut-off gates for cement and aggregates for structural concrete may be either automatic or manually controlled.

Bridge Decks. The hundreds of bridges for the turnpike and crossover roadways have posed a job problem for the contractors. To insure a smooth riding deck the original specifications required mechanical finishing of deck paving (see ROADS AND STREETS, August, 1954). Later the Commission's policy was modified to permit concrete to be vibrated and struck off with a vibrating screed. This ruling required special attention to filling of low or porous spots ahead of the screed and of immediately straight-edging to catch and correct any irregularities. An adjustment in the contractor's bid price is involved when such methods are used in lieu of a mechanical finisher.

The Harrison Contract

Contract C-1. Harrison Construction Co., Pittsburgh, Pa., N. J. Franklin, general superintendent. 5.1 miles of turnpike line; 147,000 sq. yd. of 10-in. and 3,000 sq. yd. of 9-in. (U.S. 90 approach paving).

This firm employed two Koehring 34-E dual-drum pavers; and a nearly 100% Blaw-Knox "package" outfit comprising a finegrader, a spreader-vibrator for each concrete strike-off, two finishers each with two oscillating screeds, and a longitudinal float (Koehring). Concrete was placed 24 ft. wide.

A much discussed labor-saving rig was a converted Heltzel joint machine, used as a vehicle for towing a burlap drag. The daily progress was reported to have averaged around 2,000 lineal feet per day. This was the first job to reach the paving stage, as part of the 22-mile "expedited section" nearest Ohio turnpike's junction with the Pennsylvania turnpike.

Richardson, Morehouse, Ramsey & Fisher, of Pittsburgh, was the contracting engineer for C-1; William Bryan in charge.

Winkelman's Section

Contract C-2-3. D. W. Winkelman Co., Syracuse, N.Y.; George Cecil, project manager. 10.1 miles; 300,000 sq. yd. of concrete paving; 19,000

Some of the Holderman Equipment that

● (Left) Cleveland formgrader with one crawler — one of a left-and-right pair. (Right) International vibrator used on Holderman job to consolidate subbase.

cu. yd of structure and miscellaneous concrete (13 bridges).

As an answer to speed plus flexibility in building paving and structures, Winkelman bet on a central concrete plant and truck delivery. The plant is a Johnson fully automatic plant, centered around a pair of 2-yd. Koehring stationary mixers, fed from a 150-bbl. cement bin. Facilities also included two 875-bbl. screw-fed cement silos, and an aggregate tunnel with 12 Johnson gates, dropping onto a Barber-Greene 18 in. x 200 ft. tunnel belt and a long 30 in. elevating belt to the tower (see photos). The electric motor operated assembly was powered by a pair of General Motors diesel generator units. At the stockpile a dozer fed sand and a 3-yd. dragline bucket handled slag to the tunnel.

This plant dispatched concrete to the grade in fourteen Ford-mounted 4-yd. Maxon Dumpcrete bodies.

The Winkelman equipment for single-lane pour included among other units Heltzel road forms, Thor pin driver, a Buckeye FG13 finegrader, Ferguson roller, Jackson vibrator. 2000-gal. sprinkler truck, two Jaeger spreaders (one for each lift), a Heltzel "Detroit" hydraulic finishing machine, and a Koehring longitudinal float finisher. Also a Koehler 5 kw floodlight unit having eight General Electric 300-watt lamps.

Vibration of paving concrete was done with a Maginniss electric unit mounted on the first spreader.

The concrete plant was designed to produce a maximum of 120 cu. yd. per hour. Its ability to deliver top production is shown by a few daily yardage figures. For example, the plant supplied 1,273 yd. of paving and 47 yd. of bridge-deck concrete on July 19; 1,246 yd. and 19 yd. respectively on July 20; 1,260 yd. and 19 yd. on July 22; and 1,344 yd. and 111 yd. on July 23. (10 hour days). This represented a good demonstration of the speed and flexibility of this unique set-up when bridge as well as road paving was in progress.

About two-thirds of the Dumpcrete deliveries were for the lower 6-in. lift and the remainder for the upper 4-in. lift, this ratio being adjusted to keep both spreaders supplied. The units were equipped with chutes designed for deposit of 4 yd. in 60 seconds. Radio-telephone equipment mounted on a pick-up and on a finisher kept the plant advised on slump, truck schedules and other details.

Paving equipment was ramped around unfinished bridges by lifting each unit on and off a low-bed with Northwest cranes.

In paving a bridge deck Winkelman typically used one or more Kwikmix concrete buggies and one or a pair of Stow vibratory rail screeds.

Richardson, Morehouse, Ramsey & Fisher also had engineering charge of C-2-3 under William Bryan.

The Holderman Job

Contract sections C-56-57-58-59. V. N. Holderman & Sons, Inc., Columbus, Ohio. Gail Holderman, general superintendent; George Yinger, paving superintendent. 14.7 miles of turnpike line. 433,000 sq. yd. of concrete pavement, as part of over-all contract totaling about $10 million.

Holderman made the fastest paver runs of any turnpike contractor to date, using many of the tricks reported in past issues of Roads and Streets. This firm actually sandwiched the 53 lane-miles of paving in this job in between two other paving contracts during the 1954 season, completing about 90 lane-miles with its principal paving outfit. Their turnpike job reached the paving stage in late June; all concrete was down by mid-September, except for 1¼ miles to be paved in 1955.

Two batch plant set-ups were made, the move being done by 5 or 6 trailers in carefully rehearsed stages which lost only a single day of paving. The last stretches were paved with a partial plant, as units were taken to begin the company's third project.

The minimum batch plant included a Johnson 2000-bbl. cement storage, a 400-bbl. feed tank, an oversize 3-compartment Blaw-Knox aggregate bin, and a Lima crane.

Some of Holderman's equipment and methods out on the grade:

(1). A Pitman truck-mounted hydraulic "picker-upper" (see photo) for loading forms on and off a flatbed; also used for handling heavy bundles of joint assemblies, in the yard.

(2). Two Cleveland formgraders, used uniquely as a team. Equipped, respectively, with a left and with a right crawler in place of a steel wheel, the machines traveled always forward along the two form lines. The crawlers always remained on the outer side, in the rough. This scheme saved turnarounds and use of crawlers permitted more efficient formgrading in hard compacted material.

Paved 6,000 to 7,000 Feet per Day

● (Left) Wire mesh being placed on top of first concrete lift. Note that concrete placement has stopped short of the joint (see article). (Right) Pitman Hydra-lift unit, used here to handle joint steel; designed mainly for handling road forms.

● (Left) Presstite cold rubber, asphalt joint material being applied on Holderman section. (Right) Rig used by Holderman to give center joint a wire brushing before blowing out and sealing.

(3). A Blaw-Knox improved model P-150 base paver. This machine spread a 7 to 7½ in. loose lift of screenings for the subbase, putting down about 4,000 tons per day or 5,-700 lineal feet of material 15½ ft. wide.

(4). An International shoe-type vibrator, which compacted the subbase to the prescribed 6 in. depth in a single pass. (Subbase work was done by Northwest-Shelley, of Bryan, Ohio).

(5). Two Koehring 34-E dual-drum pavers were managed in a sequence which contributed to the big daily footages. (A third 34-E single drum stood by for emergency). One placed concrete for the initial 6-in. lift. The second, having only a 4-in. lift, normally would have less than a full work load to keep up. To equalize the load, the second paver was periodically given the full depth.

A close observer would have noted that Holderman's pavers seldom had to wait on trucks, except at the outer sections farthest from the plant, where a less than full complement of trucks sometimes was used in the firm's overall economy calculations. As the pavers drew closer to the first plant setup, and as the men settled into the routine the daily footage picked up, climbing past 6,000 ft. and finally to a maximum 13-hour pouring day of 7,-015 ft. of 10-in. x 12-ft. lane — a record, it is believed.

(6). Also contributing speed was the exceptionally complete and modern single-lane spreading and finishing train. Behind the first paver on the Heltzel forms was a Jaeger CS-10 concrete spreader for the 6-in. strike-off. Behind the second paver were three Jaeger units consisting of a CSS-10 spreader with oscillating screed, and two X10-15 finishing machines each equipped with both transverse front screed and diagonally adjustable rear screed.

Then followed, not one, but two Koehring longitudinal float finishers, each with somewhat stepped up speed of float travel.

The various form-riding units were supplied with several sets of wheels to suit various conditions, including rubber-tired wheels for riding the adjacent poured lane.

Even the batch trucks showed the Holderman "touch." The cement containers were equipped with a patent-applied-for device which permits the container to trip with the batch load when the truck gate is dropped, catch in vertical position when gate is closed, the cement gate being automatically closed by the aggregate as the next batch is loaded.

Sealing of joints was accomplished with Presstite cold rubber asphalt compound.

Radiotelephone also played an important part in the management of this exceptionally long and important road contract. Twenty-eight mobile Motorola units were employed. The company was able to reach Columbus headquarters 100 miles distant via a 125-ft. mast at the field office.

Consoer - Townsend & Associates, Chicago, have served as contracting engineers on this project, with John Barjenbruch in charge.

So much for these three selected turnpike paving jobs. These notes would not be complete without mentioning the field engineering arrangement. Under the general consultants, contracting engineers (on other turnpikes called "section engineers") have prepared construction plans and performed job supervision. Under the Ohio turnpike policy the contractors, however, have been required to locate and stake out their own work, being given only the centerline and control elevations. This has required the contractors who presumably put the cost in their bids to set bluetops for cutting subgrade, stake out bridges and pipe structures from a given base line, etc. This work, especially at the elaborate interchanges, has entailed much office time in making detailed field layouts. Holderman, for example, has maintained three or four full-time survey parties under F. B. Simpson, their project engineer.

The procedure is being watched as a possible trend by highway agencies and contractors. It is said to have worked to the satisfaction of all parties on the Ohio Turnpike.

The Ohio Turnpike Project No. 1 is under the Ohio Turnpike Commission, Columbus, of which Maj. Gen. Robert Beightler, USA (Ret.) is executive director and T. J. Kauer is chief engineer. General engineering supervision is by J. E. Greiner Company, of Baltimore and Cleveland, with E. J. Donnelly and J. J. Jenkins as partners in charge and Ellis Root, construction engineer.

● (Left) Holderman's engineer, Fred Simpson, talking on one of the firm's 28 mobile Motorola radiotelephone units. (Right) Company's mobile flood unit for night clean-up on long paver runs.

From feed to finish in less than 3 seconds

Patent Pending

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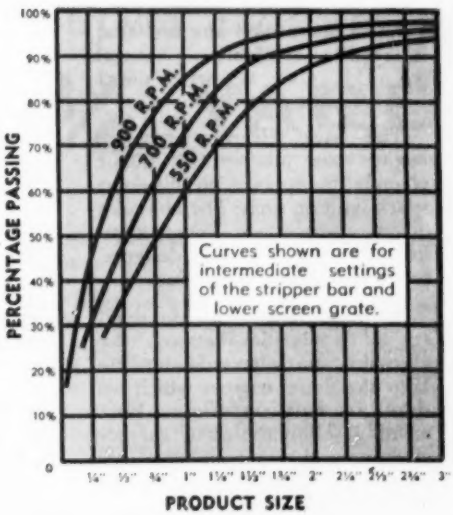

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Many of our customers have asked us, "Which type of engine would be best for me?" Perhaps this same question has entered your mind at one time or another.

Of course, there are many governing factors which should be considered in selecting the proper type of engine for a particular piece of equipment. First of all, how much horsepower is needed? Is there a type of fuel which costs less locally . . . gas, gasoline, L.P. Gas, kerosene or fuel oil? How much money will be involved in the initial purchase? How much money can you expect to save by using a low-cost fuel? Will it be enough to offset the extra cost of a special type of engine? These and many other questions should be objectively answered before any engine is purchased.

We have no particular cause to champion and do not attempt to take sides or promote the use of one fuel over the other. As you know, we manufacture all types of internal combustion engines to operate on any fuel that is readily available. (Natural gas, L.P. Gas, kerosene, diesel fuel, gasoline, etc.)

The basic Hercules gasoline engines are adapted by minor changes to operate on different spark-ignition fuels. The Hercules diesel engines are compression ignited — specifically designed for operation on diesel fuel.

We have, however, maintained several similarities between the Hercules spark-ignited and the Hercules diesel engines which we think are very important. First of all, gasoline and diesel engines of comparable piston displacement have similar mounting dimensions and operating characteristics. Generally speaking, this makes it possible for equipment to be powered by either Hercules gasoline or diesel engines without creating any major installation problems. Thus, equipment manufacturers are able to supply customers with the proper type of engine to assure "top-notch" economies, according to the customers' operating conditions.

Another similarity between our gasoline and diesel engines, is that they both are of the 4-cycle design. The 4-cycle design is universally accepted and understood. This feature provides for less complicated engine servicing and in addition, service is readily available throughout the country.

What does all this mean to you? Maybe we can sum it up in our motto, "Engine Manufacturing Specialists Since 1915". Actually, we're custom engine builders with manufacturing facilities. Our engineering and sales policy is to design and sell engines to meet the exacting needs of our customers.

As a result, we have 70 basic models of gasoline and diesel engines which range from 3 to 500 H.P. They are available in many different designs . . . vertical and horizontal engines, special fuel handling equipment, various types of flywheels, etc. . . . in fact, we probably have an engine that will fit your particular needs to a "T".

Whether it's Agricultural, Oil Field, Automotive, Construction, Industrial, Marine or any other engine application, our engineers will gladly assist you in the proper selection of power for your equipment. Give us the details, so that we understand your problem, and we'll provide the answers to your power problems.

HERCULES ENGINES

HERCULES MOTORS CORPORATION

107 Eleventh Street, S. E. • Canton, Ohio

Court Decisions That Affect Jobs

Highway by prescription

By Albert Woodruff Gray

A roadway in New Hampshire traversed the land of four intervening farms to a fifth whose owner sued for an injunction against these intervening owners for interference with his use of this road.

Over sixty years before a former owner in a deed of this land had reserved a right of way over these farms and for over twenty years this road had been used as a public highway under a claim of right.

The court in awarding an injunction against interference with the use of the road said it had been used for access to a brickyard, sawmill and slaughter house and by fishermen, hunters and berry pickers. "The burden of establishing that the use was permissive was upon these interfering owners and that burden has not been conclusively sustained."

White Mountain Freezer Co. v. Levesque, 104 Atl. 2d 525, Maine, April 21, 1954.

Contractor can sue union

Public Law 356 (Virginia) has undergone its first legal test in the U.S. Court of Claims. This law was passed to nullify the decision of the U.S. Supreme Court in the Wunderlich Case (342 U.S., 20). The U.S. Court of Claims (Justice Whitaker) in Wagner Whirler & Kerrick Corp. v. U.S. 6/8/54 ruled that "Public Law 356 reinstated the rule applied in this court prior to the Wunderlich decision." The old rule was that decisions of the contracting officer or department head are not final where they were arbitrary or capricious, or so grossly erroneous as to imply bad faith or failure to exercise judgment.

The effect of the Supreme Court in the case of the United Construction Workers v. Laburnum Construction Co. is that no action can be brought in a State Court to stop a strike, picketing or other labor action but that suits for damages against the initiating union may be brought in such State Courts. — *Virginia Road Builders Association Bulletin.*

Here's what they say about the new

MICHIGAN® 3/4 YARD

Contractor: Hendrickson Bros., Inc., General Contractors
Valley Stream, New York

Job: Excavation and pipe laying for Southern State Parkway, Long Island

MASTER MECHANIC:

"We tried out the new T-24 for a week; and because it did such a good job in that short time, we bought it."

OPERATOR:

"It's got delicate control and positive action. I can put the bucket down just where I want it, pick up a cable or wooden stake and not even disturb the dirt. It's a fast machine."

OILER:

"This Michigan is an oiler's dream. The liberal use of ball bearings on shafts, drums and rollers means less wear and much less oiling. All we do is oil our T-24 once a week."

There's little to add to these Hendrickson statements—except to emphasize that you, too, will move bigger yardage faster and at less cost with a MICHIGAN Series "24" ¾-yard excavator-crane. Best way to prove it is to do as Hendrickson did . . . TRY IT! Send for the booklet "Bigger Yardage Through Air Power"; and for detailed specifications.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Div.
394 Second Street
Benton Harbor, Michigan 24

Please send the booklet "Bigger Yardage Through Air Power" and specifications of MICHIGAN Series "24".

Name_____

Firm_____

Address_____

City_____

On VEPCO'S Roanoke Rapids, N. C.

it's SHELL.*

Hydroelectric project . . .

Gasoline
Fuel Oil
Diesel Fuel
Kerosene
Industrial Lubricants

Solvents
Motor Oils
Anti-Freeze
Greases
Outboard Motor Oil

The Roanoke Rapids Project for the Virginia Electric and Power Company, being constructed by Stone & Webster Engineering Corporation, is going full speed ahead. This extensive job keeps hundreds of pieces of heavy construction equipment busy, day and night. Nearly 100% of this equipment relies on Shell Industrial Lubricants and Fuels to meet the rigorous operating conditions.

When completed, Roanoke Rapids project will supply 100,000 kilowatts of electricity for Vepco's system.

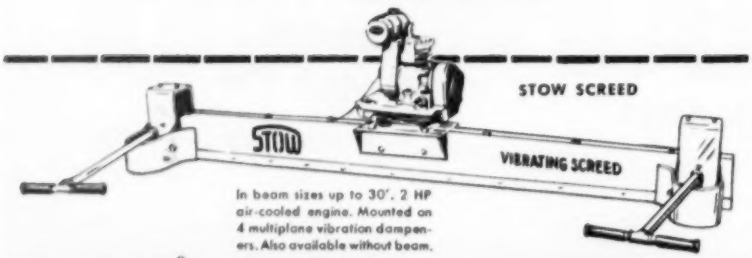
Widely used in construction work and wherever heavy duty equipment operates, Shell lubricants protect machinery and at the same time keep maintenance costs at rock bottom. Perhaps it will pay *you* to look into the savings of a 100% Shell program.

SHELL OIL COMPANY

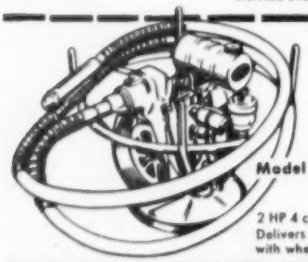
50 WEST 50TH STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

*A diligent search could uncover only one piece of Vepco's equipment NOT using a Shell product.

Concrete facts about Concrete Vibrators and Screeds

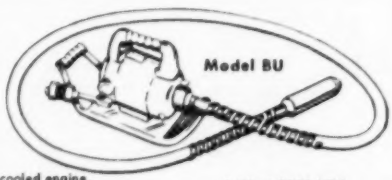


In beam sizes up to 30', 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.



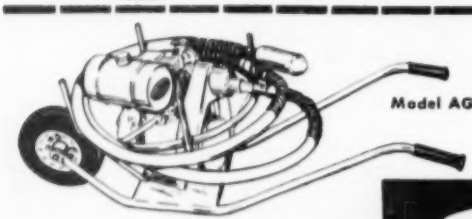
Model BG

2 HP 4 cycle air-cooled engine. Delivers 6000 to 9300 Available with wheelbarrow mount.



Model BU

2 HP at 9000 VPM 115 V. AC or DC



Model AGW

4½ HP 4 cycle air-cooled engine. Mounted on wheelbarrow for easy maneuverability. Delivers 6000-9300. Available without wheelbarrow.

Here is the name you want!

STOW

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so *attachments may be used directly on the vibrator shafts.*

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

See your STOW distributor about STOW vibrators and screeds today. Send for free Bulletin 526.

STOW MANUFACTURING COMPANY
65 Shear Street Binghamton, New York

WHAT'S NEW
in EQUIPMENT and MATERIALS

Use bound-in postcard for convenience in inquiring about these products or those described on advertising pages.

All-Weather Cab for Tractor Shovels

An all-weather, molded steel cab is now available for all models of the Michigan tractor shovels being built by the Construction Machinery Division of the Clark Equipment Co., Benton Harbor, Mich. This is in addition to other styles of cabs previously introduced for the tractor shovels. Designed for easy field installation, the heavy-duty cab has all around and overhead vision through safety glass windows set in rubber molding. The rear section, which has sliding windows, rolls freely on track and can be removed in five minutes. The glass in the overhead window is tinted to eliminate sun glare. The movable rear section of the cab will lock open or closed in any position. A quick release mechanism frees the lock when the cab is pulled back to open.

All-Weather Cab for Michigan Tractor Shovels

45 Ton Crane Carrier

A new 45 ton crane carrier, announced by Dart Truck Co., Kansas City 8, Mo., is powered with a 240 HP Waukesha gasoline engine. The unit utilizes a Fuller 10-speed transmission and 100,000 lb. rear tandem axles. Tires are 14:00 x 24, single front and dual rear. Among the construction features of the new carrier are Dart's box girder frame with single box outriggers with boxed beams extendible to 15½ ft. A one-man cab offers the operator exceptional visibility and Vickers hydraulic steering combined

Dart 45 Ton Crane Carrier

Jaeger "turnpike team" lays 12' slab as fast as 2 dual 34E's can pour

CONTINUOUS FORWARD PROGRESS . . . nothing back-tracks, even on super-elevated curves

Forward paver and Jaeger screw spreader pour and spread base course, on which reinforcing mesh is placed.

On top course, second paver is followed by Jaeger spreader *equipped with metering screed* and Jaeger finisher which is *equipped with diagonal rear screed whenever the job involves laying pitched slab or super-elevated curves.*

The oscillating metering screed of the spreader used on the top course makes precision strike-off just above form level, leaving an ideal surface for the finishing machine to work on.

Diagonal rear screed of finisher can be adjusted to any angle needed to work material to the higher side of pitched slab or super-elevated curves and compact solidly against the high form. Eliminates carry-back, cuts hand finishing to a minimum. For full details, see your Jaeger distributor or send for paving catalogs.

THE JAEGER MACHINE COMPANY

223 Dublin Avenue, Columbus 16, Ohio

PUMPS • COMPRESSORS • LOADERS • CONCRETE MIXERS • TRUCK MIXERS

MINUTE MAN of MOVING MIRACLES

MIRACLE is a strong word but when the operator of this trailer can detach the gooseneck—unload a ponderous shovel and reattach the gooseneck in as little as 5 minutes it is truly *miraculous*.

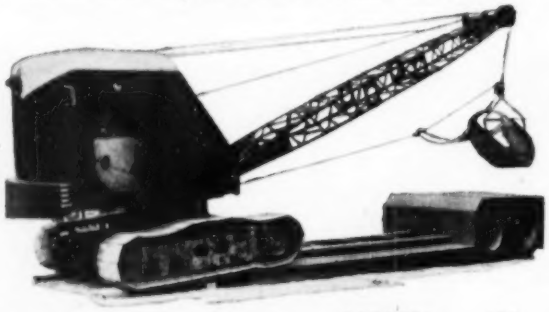
This is being done with the Rogers Power-Lift Detachable Gooseneck Trailers. Moreover, operators can quickly lower the gooseneck for the load to clear low overhead obstructions or raise it to pass over high banked railroads, etc., often avoiding detouring and saving much valuable time.

If you don't have the late Rogers literature, you're not "up" on recent trailer developments. Write for the catalog today.

EXPERIENCE builds 'em

ROGERS

PERFORMANCE sells 'em



ROGERS BROS. CORP. ALBION, PENNA. 110 Orchard Street

Export Office: 50 Church St., New York 7, N.Y. U.S.A.—Cable Address: Brosites

Divided bed, tilt deck trailer with gooseneck.

with a Ross steering gear makes the unit easy to maneuver. The overall length of the carrier is 29 ft., width is 10 ft., 6 in. and the gross weight without upperworks is 50,000 lb. Dart provides optional wheelbase to meet crane manufacturers' specifications.

Crawler Tractor Backhoe Combination

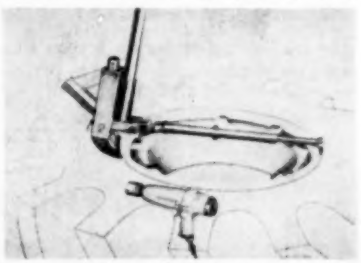
A new hydraulically operated Pippin backhoe developed specifically for use on TerraTrac crawler tractors has been announced by American Tractor Corp., Ft. Wayne, Ind. The new digging tool, known as the "TerraTrac-Pippin Special" was developed through the combined engineering efforts of the American Tractor Corp., maker of TerraTracs, and the Pippin Construction Co., White River Junction, Vt., to gain maximum working efficiency of both tools. With an over-all width of only 5 ft., and a height of less than 5 ft., the TerraTrac-Pippin Special can be operated in close quarters. Its reach of 16 ft. makes it possible to dig clean, vertical-walled trenches 10 ft. below grade. It also has a 9 ft. dumping

TerraTrac-Pippin Special

height for piling dirt well out of the way, or loading into high trucks. Bucket widths range from 12 to 40 in. The TerraTrac-Pippin Special is being rear-mounted on three TerraTrac models — the GT-32 and GT-32 (gasoline) and the DT-34 (diesel). All three tractors can be equipped with a front-mounted TerraTrac loader or dozer blade. A special swivel seat makes it easy for the operator to face in either direction to operate front or rear attachments, or to move the tractor as needed.

Bead Loosener for Large Tires

A new bead loosener for the large tires used on off-the-road equipment, announced by Bishman Manufacturing Co., Osseo, Minn., exerts up to 10,000 lb. pressure on the bead to break it away from the tapered bead seat rims now being used on these wheels. The tool is simple to operate and loosens both beads with wheel off or outside bead with wheel on machine. A long arm provides

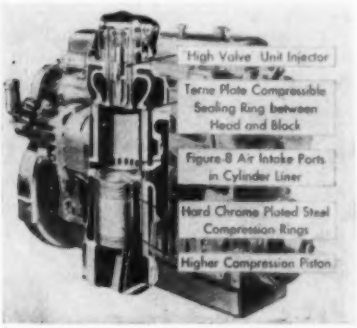


Bishman Bead Loosener

the leverage necessary to force the tapered steel fingers between tire bead and rim flange. A screw, operated by a ratchet wrench or impact wrench, then breaks the bead away from the rim. The loosener can also be used for truck and bus tires. A hub adapter for wheels having extended hubs is also available.

Changes in GM Diesel Series "71" Cylinder Assembly

Improvements recently effected in the cylinder assembly of General Motors Series "71" diesel engines provide better fuel economy, increased horsepower in some sizes and longer life for these power plants in all types of industrial, construction and earthmoving equipment.


High Valve Unit Injector
Terne Plate Compressible Sealing Ring between Head and Block
Figure-8 Air Intake Ports in Cylinder Liner
Hard Chrome Plated Steel Compression Rings
Higher Compression Piston

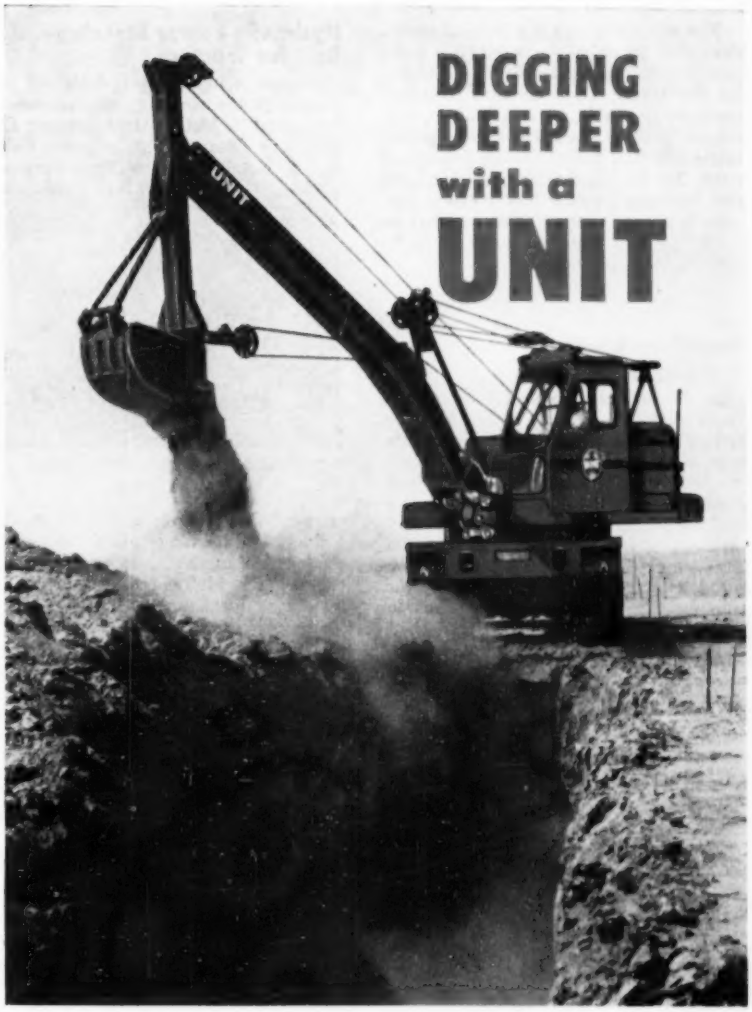
Features of New GM Series "71" Assembly

A bulletin issued to GM diesel distributors and dealers by the Detroit Diesel Engine Division states that these improvements and other previously announced complete an entirely new cylinder assembly for the Series "71" engine. The improvements are listed as a new cylinder liner which provides a freer flow of air into the cylinder, a new piston which increases the compression ratio, and longer-life compression rings. The bulletin states the new liners and pistons are interchangeable with those formerly used and may be installed on engines now in service in any combination as replacements become necessary.

An illustrated booklet, "The Inside Story," describing the new Series "71" cylinder is available from Detroit Diesel Distributors and Dealers or by contacting Detroit Diesel Engine Division, 13400 W. Outer Drive, Detroit 28, Michigan.

Two New Auxiliary Truck Transmissions

Two new auxiliary transmissions have been added to the line of special truck equipment, produced by Truckstell Manufacturing Co., Union Commerce Bldg., Cleveland 15, Ohio. The first auxiliary is a 2-speed model designed for trucks that have adequate gear splits but need greater pulling power for climbing steep grades or for off-highway operation. It provides an underdrive ratio of 2.18 to 1, more than double the pulling power in compound low. The model is light in weight, and is designed to serve trucks with gas engine displacement of up to 265 cu. in.



You'll Dig More Jobs At More Profit With A UNIT TRENCHOE!

Accurate deep digging of trenches for pipelines, sewers, water connections, footings, basements and culverts is easily and quickly accomplished with a UNIT Trenchoe. The "Goose-neck" boom with its long deep reach assures maximum production. Also saves time trimming vertical sidewalls and corners, and in leveling floor surfaces. Powerful... Compact... Perfectly Balanced. Every UNIT is designed to meet the most rigid demands. Investigate today and earn more pay.

UNIT models are available in ½ or ¾ yard Excavators . . . Cranes up to 20 tons capacity . . . Crawler or Mobile types . . . Gasoline or Diesel. Ask for literature.

UNIT CRANE & SHOVEL CORPORATION
6407 W. Burnham St. • Milwaukee 14, Wis., U. S. A.

Geared to Produce Maximum Yardage

A 8056-¾-C

The other new unit is a 3-speed model designed to meet the need for extra power gears and gear splits in all popular size trucks. Optional ratio combinations are available, as is a built-in, full engine torque, variable speed power take-off. It has constant-mesh helical-cut gears for quiet, trouble-free operation and lightweight clutch blocks which provide fast, easy shifting. This auxiliary is built for duty with gas engines up to 400 cu. in. displacement.

Mast Type Gantry

The Northwest Engineering Co., Chicago, Ill., manufacturers of crawlers and truck mounted shovels, cranes, draglines and pullshovels, has announced that a new type of gantry, known as a mast type gantry, will be made available for Northwest Model 6 cranes and draglines. This gantry which replaces the gantry formerly used on these machines, materially increase the ease and speed in lowering the gantry for low clearances when traveling or shipping. The gantry is extremely simple and rugged in design and it is furnished with section boom hoist rigging with pendent lines. Users of Northwest Model 6 machines in the field will also be interested in the fact that the mast type gantry is available to replace the old standard or rearward type gantry formerly used on these rigs.

Hydraulic Power Steering Unit for Tractors

A new compact, self contained hydraulic power steering unit, announced by Leland T. McGee Manufacturing Co., Inc., 410 Dixon Ave., Compton, Calif., can be installed on any Ford, Ferguson

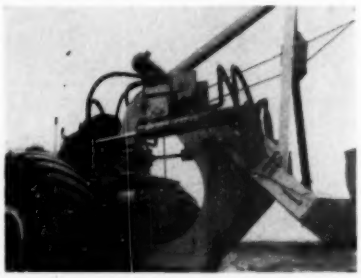
McGee Steering Unit Installed on Tractor

or Ford-Ferguson tractor without disturbing or discarding any of the regular tractor steering mechanism. Advantages claimed for McGee hydraulic steering include: a maximum of 1500 lb. power steering pressure; positive finger-tip control of the steering wheel; reduction of operator fatigue; freedom from "fighting the wheel" when working under severe conditions; elimination of wear and tear on tractor steering mechanism; effortless steering, which helps maintain accurate control of tractor mounted equipment.

Shepherd Hydro-Steer for Super C Tournapulls

Automatic, positive, hydraulic steering control is supplied to LeTourneau Super C Tournapulls by means of the Shepherd "Hydro-Steer." This unit, consisting of heavy-duty hydraulic rams mounted between the tractor and scraper, affords positive directional control through two mono-directional hydraulic systems which permit change in ram position only when regular operator controls are actuated, and only in the desired direction.

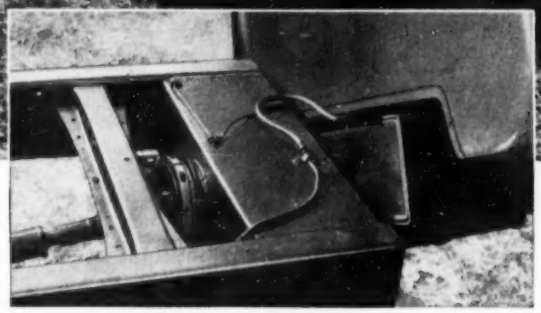
Completely self-contained and requiring no engine power, this equipment will hold the Super C in a straight line regardless of wheel slippage, grade, overpushing, or operator inattention. Full engine power for traction and full braking of both drive wheels are available



A Close-Up of the Hydro-Steer

Simplifies Concrete Cutting
FELKER DI-MET
MODEL 200
MORE MANEUVERABILITY...
LESS WEIGHT...
POWER FOR BIG JOBS OR SMALL!
This NEW Felker DI-MET CONCRETE CUTTER meets all cutting requirements at LOW COST! Takes deep cuts and covers the footage of big machines, yet handles as easy as a baby buggy. Light weight means more maneuverability on close-ups, easier loading for fast transportation. Holds straight and true on long stretches. Uses economical 10" or 12" blade sizes. Cuts up to 3¾" deep with 12" blade. 13.5 h.p. Wisconsin engine provides ample power even for 14" blades and deeper cuts (by equipping with special blade guard). Hydraulic lift raises blade from cut, velvet-smooth hydraulic retardant eases blade into concrete—saves wear, increases blade life.
ADD ACCESSORIES AS YOU NEED THEM!
This new DI-MET Model 200 is available as a BASIC UNIT or may be purchased with additional accessories. POWER DRIVE and COOLANT PUMP ASSEMBLIES can be field installed. STARTER, GENERATOR and BATTERY must be ordered with the ENGINE. Choose what you need, buy what you want!
Many other exclusive features —ask for circular!
CELEBRATING OUR 30th ANNIVERSARY
SINCE 1924
FELKER DI-MET
Made by the only manufacturer building both CONCRETE CUTTING MACHINES AND DIAMOND WHEELS... the winning combination that means more footage at less cost!
FELKER MANUFACTURING CO.
TORRANCE • CALIFORNIA
World's Largest Manufacturer of Diamond Abrasive Cut-off Wheels and Machines

REVOLUTIONARY NEW SWIVEL FRAME BOOSTS TRUCK LIFE AND TRACTION!



STRONGER THAN EVER! EASIER TO DRIVE! GREATER PROTECTION FOR TRUCK, BODY AND LOAD! Now your trucks can travel the roughest terrain—without frame twist or distortion—assured of traction and maneuverability never before possible!

For Swivel Frame permits the front and rear halves of a truck to rotate to either side independently. No sprung cabs or jammed doors; no front wheel fight; no frames "dying from fatigue". Chances of damage to body, chassis and load are practically eliminated.

Swivel Frame consists of two heavy-duty box sections (placed where frame is divided) joined by a high-strength alloy-steel tube. All bearings are dust and dirt-sealed. Swivel Frame installations are stronger than original truck frame members . . . have been *proved* on thousands of miles operation in many varied off-and-on road vocations.

Slash maintenance costs, lengthen service life and increase your truck's ability to go places with Swivel Frame! Low-cost models are engineered for all popular make trucks and all types of drives. Send for full details today.

Truckstell

MANUFACTURING COMPANY

Makers of famous Truckstell Dual-Axle Drives, Hydro-Trac 3rd Axles, auxiliaries and other types of special truck equipment.

Truckstell Manufacturing Company, Department S-4
Union Commerce Bldg., Cleveland 14, Ohio

Rush me your new, illustrated Swivel Frame folder and name of nearest Truckstell Distributor.

NAME_____

FIRM_____

ADDRESS_____

MAKE OF TRUCK(s)_____

BLAW-KNOX BASE PAVERS

MODEL P-150 LAYS BASE PAVEMENT UP TO 400 TONS PER HOUR

• Base course paving is fast, accurate and economical with this high tonnage producer. You can spread stone, slag, gravel, soil cement or crusher run aggregates to depths up to 20" and widths up to 16' in one pass, with no separation of material. There's plenty of traction and power to push your trucks, yet flotation for the softest surfaces. Oscillating action of the V-type screed "knits" material into the voids for accurately level and smooth base courses. Operating costs are low. Hand dressing behind the unit is reduced to the minimum. Blaw-Knox Apsco Base Pavers are available in two models to meet every base pavement requirement. Write for complete details in Bulletins 2457 and 2459.

BLAW-KNOX APSCO ROAD WIDENERS

These heavy-duty time and labor saving units handle concrete *without forms*, asphaltic concrete and any kind of aggregate. They spread and finish concrete up to 1½ miles per day . . . build earth shoulders at the rate of 200 tons per hour. Two sizes available to meet your needs. Send for Bulletin 2458.

Ask your BLAW-KNOX DISTRIBUTOR about the *"Complete Packages"* of Concrete Paving and Ready-Mixed Concrete Equipment

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PENNSYLVANIA
Offices in Principal Cities

BLAW-KNOX

under all conditions. Jack-knifing and inadvertent control reversal are eliminated and machine capacity increased under adverse conditions. Safety in high-speed haul or highway transport operation is increased.

It is stated that Hydro-Steer is easily installed with regular welding equipment. Standard operator controls remain the same as before and require no change in method of operation. All mechanism is simple and easily adjusted and maintained. High pressure is not constantly maintained in the system, but positive locked hydaulic steering is operative at all times. The manufacturer is Shepherd Tractor & Equipment Co., Atlantic & Bandini Blvds., Los Angeles 22, Calif.

All-Steel Barricade

A new all-steel barricade, announced by Fenton Industries, Los Angeles, Calif., has a baked-enamel finish estimated to have 10 times the life expectancy of the usual painted wood barricade finish. Long service without maintenance is stated to be assured by bolt and nut and riveted construction. The over-all barricade is traffic yellow finish with baked enamel "Caution" lettering. The unit is adaptable to Scotch Lite if desired. It is stated that not only is the Fenton barricade far sturdier than its wooden counterparts, but at least twice as many can be hauled per load or stored in the same space as wooden units. It has no nails to pull loose nor boards to splinter. An exclusive light-locking feature prevents theft of the light. The illustration shows the new barricade, the Fenton collapsible emergency unit and a traffic divider with Scotch Lite panel.

Barricade, Collapsible Unit and a Traffic Divider

Quick Moving Discharge Chute

Automatic adjustment of the discharge chute of mobile truck transit-mixers is provided by the new Monarch "Dyna-Chute" electric hydraulic power control. One-man, one-lever operation raises, lowers, or holds the chute in position. Remote control provides safety for the operator because the arrangement eliminates the use of extra men to adjust pins, ratchets, and bars beneath the mechanism. It is stated that with 2,000 lb. pressure and one-gal. per minute volume, the Dyna-Chute moves loaded chutes into position in less than ten seconds.

Available as specified for 6 or 12-volt

Monarch's New Truck Mixer Discharge Chute

systems, the Dyna-Chute combines the pump, motor, valve, oil reservoir, and solenoid in one unit. Also included are a 15-foot insulated battery cable, hydraulic ram, flexible hose, and fittings for all average installations. The control is protected from the weather by a durable steel hood. Mounting is simple and can be completed with a minimum of time and tools.

For further information, apply to Monarch Road Machinery Co., 1331 Michigan St., N. E., Grand Rapids 6, Mich.

New Post Driver Designed for Speed

Little Giant Crane & Shovel, Inc., East 16th and Howard Drive, Des Moines 13, Iowa, has announced the machine here pictured for the fast driving of guard rail or other posts. Turnpike and expressway construction are cited as typical fields of use.

The driver is available for Little Giant Model "L", for mounting on a customer's truck, or as a "complete-and-ready-to-operate" rig from the factory. Power can be either gasoline or diesel. There is full convertability to other attachments.

Little Giant Post Driver

Points stressed by the manufacturer include the following: the unit drives wood or metal posts straight and true regardless of road incline, curves or position of truck. The short tail swing permits uninterrupted traffic flow. Job reports indicate that 375 to 450 posts per day can be driven with a loss of less than ten posts in 160,000 ft. of guardrail. Wholly modern mechanical details provide both strength and simplicity.

WELLMAN STONE GRAB

Moves the "big ones" faster!

THE Wellman Stone Grab thrives on rugged work. This tough grab is built with three jaws for gripping big, irregular-shaped stones with speed and safety. Develops tremendous closing force in its jaws. Welded construction and alloy steels give great strength with minimum dead weight. Available in 5, 10 and 15 ton sizes.

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CLEVELAND 4, OHIO

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Blaw-Knox "Hi-Boy"

New Truck Mixers with Short Wheel Base

Blaw-Knox Company announces a third new truck mixer, the 4½-cubic yard capacity size, in the Model M series, which is now in full production. The Model M is also made in 5½- and 6½-cubic yard sizes. All units have been thoroughly field tested and are now in commercial use.

The units have been designed to make a compact yet accessible mixer-agitator that would give users the maximum pay load at minimum weight on the shortest possible wheel base. All Model M series are guaranteed to mix ¼-cubic yard more than their normal rating, and to conform in every respect to the latest revision of the standards of the Truck Manufacturers Bureau. (Blaw-Knox is member).

Model M Hi-Boys can be furnished with either an open or closed end drum. Drum diameter is large, for fast and thorough mixing. The stationary charging hopper fits into a large diameter charging cone which rotates with the drum. This charging cone eliminates spilling of materials during the charging operation and permits fast loading (8 to 9 seconds per yard). It also materially increases the water level capacity of the drum. Spillage of concrete on steep grades is prevented by a drip shield on the charging hopper as the spiral blades dam the opening between the charging cone and the drum shell.

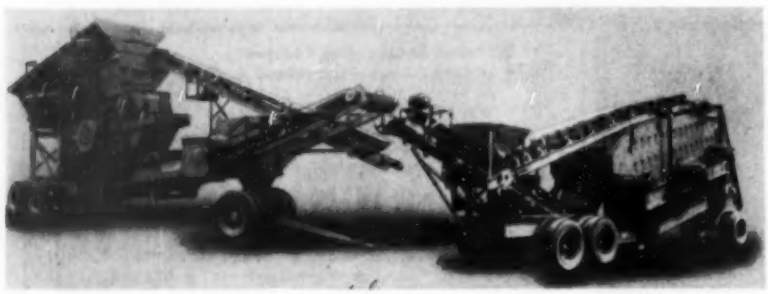
More detailed information on the Model M, 4½-yard size is contained in Bulletin No. 2478. Other Model M series are described in Bulletins 2455 and 2461, all of which can be obtained from Blaw-Knox Co., Blaw-Knox Equipment Division, Pittsburgh 38, Pa.

Crushing, Screening and Loading Plant

A new two-unit hammermill crushing, screening and loading plant designed for operation in wet, sticky materials and in quarries contaminated by clay balls and mud pockets has been introduced by Universal Engineering Corporation, Cedar Rapids, Iowa, subsidiary of Pettibone Mulliken Corporation. The plant features a Bulldog Model HM-04-NC, non-clog portable hammermill unit teamed with a Universal Model 5142 portable screening unit. The combination will produce aglime and road rock, aglime and chips, or 100% aglime as desired.

The entire crushing operation is performed by the Bulldog HM-04-NC non-clog hammermill operating in closed circuit. The hammermill is equipped with a moving breaker plate and a moving cleaning bar. The moving breaker plate prevents build-up of material in the breaking chamber, the moving cleaning bar keeps the discharge free at all times. The portable hammermill unit consists of a 42 in. x 12 ft. apron feeder with shovel loading hopper, the Bulldog HM-04-NC non-clog hammermill, 36 in. front delivery conveyor, 18 in. return circuit conveyor, and operator's platform all mounted on a steel gooseneck truck with pneumatic tires. With the exception of the hammermill which is diesel powered, all units are all electric push button controlled.

The Model 5142 portable screening unit consists of a 5 ft. x 14 ft. double deck inclined gyrating screen with 70 sq. ft. of screening area in each deck and a ball tray deck under the second deck for maximum efficiency when producing aglime, 30 in. channel frame feed conveyor, 30 in. front delivery conveyor, 24 in. side delivery conveyor, and 18 in. channel frame return circuit conveyor all mounted on a pneumatic tired gooseneck truck. It is all electric drive with convenient control panel located on the operator's platform of the crushing unit.



Universal Model HM-04-NC Portable Hammermill Crushing Plant with Universal Model 5142 Portable Screening Plant

Wedge Fitting Swivel

A new wedge fitting, designed to speed hook up and save head room, has been added to the Miller swivel line, manufactured by General Machine & Welding Works, Inc., 1100 East Second St., Pomona, Calif. The quick connecting, easy-to-use wedge fitting common to single line hoisting in the construction industry is incorporated right in the body of the swivel. This saves up to 8 in. of head room, an important saving on many jobs. Miller ball bearing swivels are claimed to provide perfect load control on any wire line. It is stated that a heavy concrete bucket, for example, can be easily rotated to the exact position required when a Miller swivel is used.

Miller Wedge Fitting Swivel

Plastic Pipe for Many Uses

A new lightweight flexible plastic pipe has been developed by Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., Philadelphia 24, Pennsylvania, according to G. A. Dauphinais, Vice-President and General Manager.

Known as Series "200," this pipe is made of 100% virgin polyethylene resin, and guaranteed to be non-toxic.

Typical applications include cold water systems, farm piping, sewerage and waste, water service lines, and for conveying industrial chemicals and gases.

For more ideas on Equipment and Materials . . . see page 109

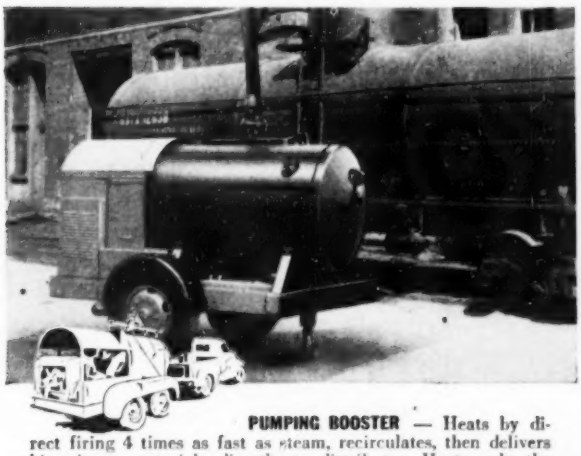
"You get FAST ACTION — to the job...on the job"

... with Cleaver-Brooks oil and bitumen heating equipment!

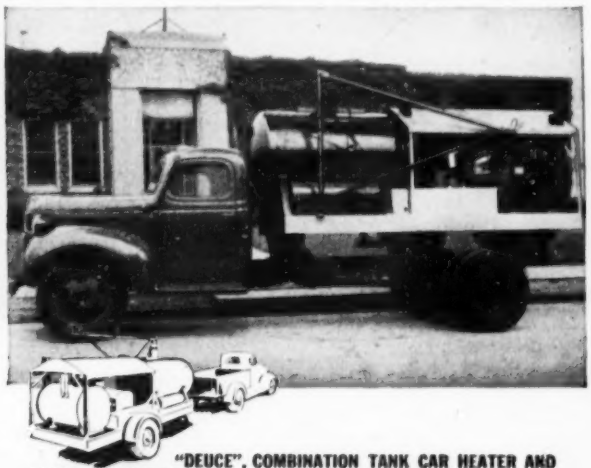
These self-contained mobile units can be ready to pump, heat and circulate bituminous materials in 20 minutes or less after arrival

If your job can be reached on wheels, any one of these famous Cleaver-Brooks mobile heating units can save you plenty of time and money. Each can be transported as easily as you drive your car . . . put into operation with minor connections — by only one man! Their proven high efficiency, man hours saved, plus elimination of field problems can be important factors in your profit picture. That's why you'll want to know more about famous Cleaver-Brooks Tank-Car Heaters . . . Pumping Boosters . . . and "Deuce" combination tank-car heater and pumping booster. It's the mobile bituminous team that does more work . . . with faster heat, higher temperatures and with less fuel. Write for details. Cleaver-Brooks Company, M-394 E. Keefe Avenue, Milwaukee 12, Wisconsin.

TANK CAR HEATER — Shoots steam through tank-car coils at 125 lbs. pressure in 20 minutes or less from a cold start. Can be kept going at full tilt all day. Oil firing plus extra high-heat transfer design, assure extra fuel savings. Turbine-type condensate return means less water required. Available in two-car (28 BHP) and three-car (42 BHP) sizes, trailer and skid-mounted models. Ask for Bulletin RM-110.



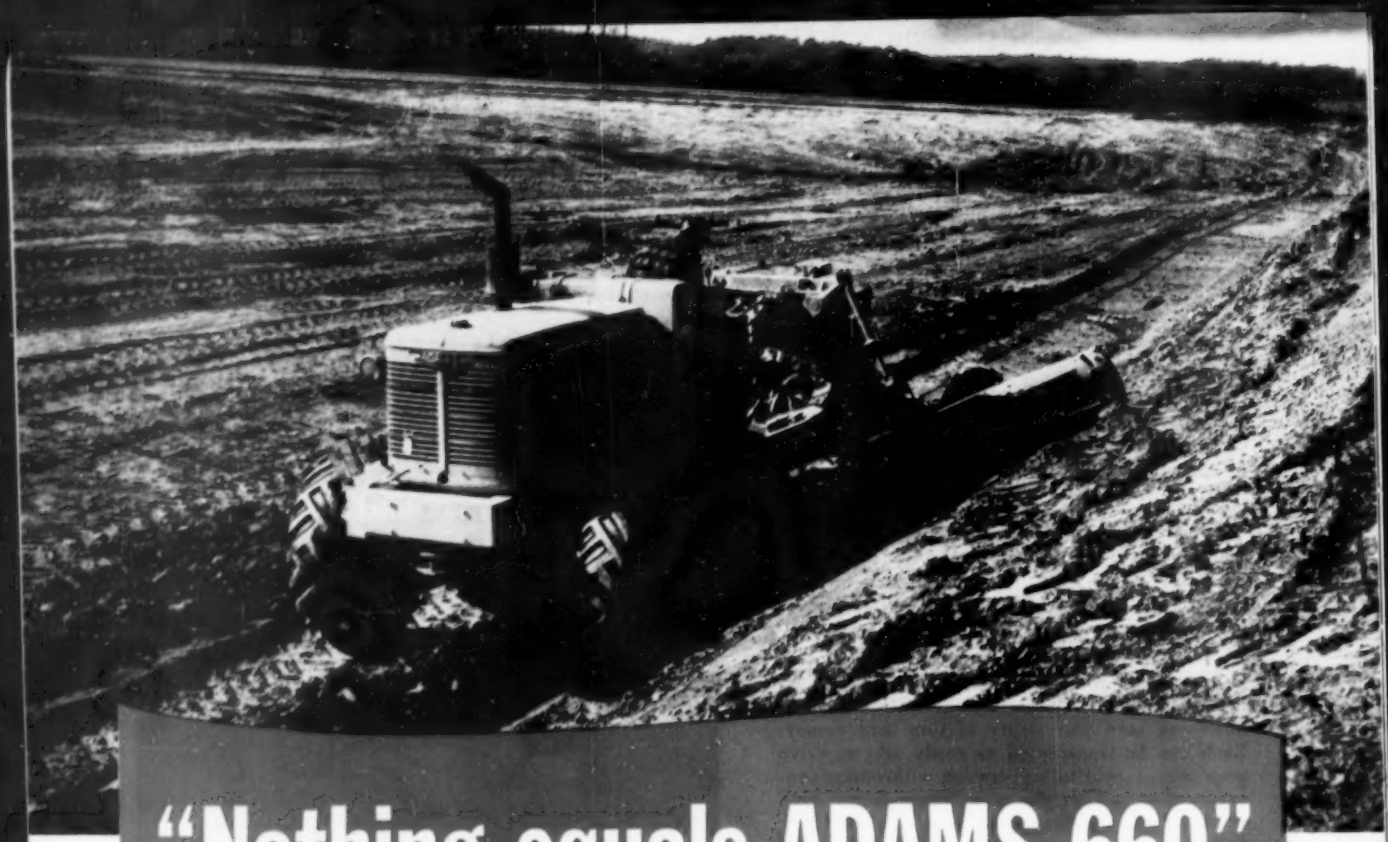
PUMPING BOOSTER — Heats by direct firing 4 times as fast as steam, recirculates, then delivers bituminous materials directly to distributor. Heats only the amount of material required — not necessary to heat entire car. No steam or water required for operation. Has self-contained fuel and gasoline tanks. Available in two sizes, trailer and skid mounted: No. 1A Booster heats approx. 300 GPM temp. rise 25°-35°F; No. 2 Booster heats approx. 350 GPM temp. rise 45°-55°F. Ask for Bulletin AD-109.



"DEUCE", COMBINATION TANK CAR HEATER AND PUMPING BOOSTER — It's a portable steam boiler *and* direct-fired heater mounted on a single frame. Look at this three-job versatility! "Deuce" steam preheats one car to pumpable consistency while circulating and heating a second car to application temperatures. Same unit also pumps and loads distributor or transfer truck. Ask for Bulletin AD-109.

Cleaver-Brooks

Pioneers and Originators of Self-Contained Boilers, Tank-Car Heaters, Pumping Boosters, The "Deuce" and "Peak-Temp"



"Nothing equals ADAMS 660"

says WILCO BUILDERS

● The 140 hp. Adams "660" Motor Grader shown above is working on the Ohio Turnpike. It is owned by Wilco Builders, who say, "For ease of operation, power and output there is no comparison between the Adams "660" and any other grader we have owned. Its powerful engine enables us to get more work done with less effort."

Such owner satisfaction is making Adams *Improved* Motor Graders more and more popular with contractors and highway officials everywhere . . . for Adams Motor Graders give them more time-saving, work-producing advantages than any others on the market—*bar none!*

Let your near-by Adams dealer show you the model best suited to your needs.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

ADAMS offers 4 models, ranging from 75 hp. to 140 hp., all featuring these advantages:

- New Constant-Mesh Transmission
- 8 Forward Speeds
- 3 Creeper Speeds (optional)
- 4 Reverse Speeds
- Dual Braking System
- Rubber-Mounted Engine
- Foot Accelerator

Make your next motor grader an

ADAMS

ROADS AND STREETS

LOW COST ASPHALT SURFACE REPAIR AND MAINTENANCE...

with the *New* LITTLEFORD CLARKMOORE ASPHALT ROAD HEATER-PLANER

FOR HEATING AND PLANING BITUMINOUS ROADS, STREETS AND AIRPORT RUNWAYS

Littleford-Clarkmoore Heater-Planer permits low cost resurfacing, speeds up major maintenance and repair work on bituminous highways, roads, streets or airport runways.

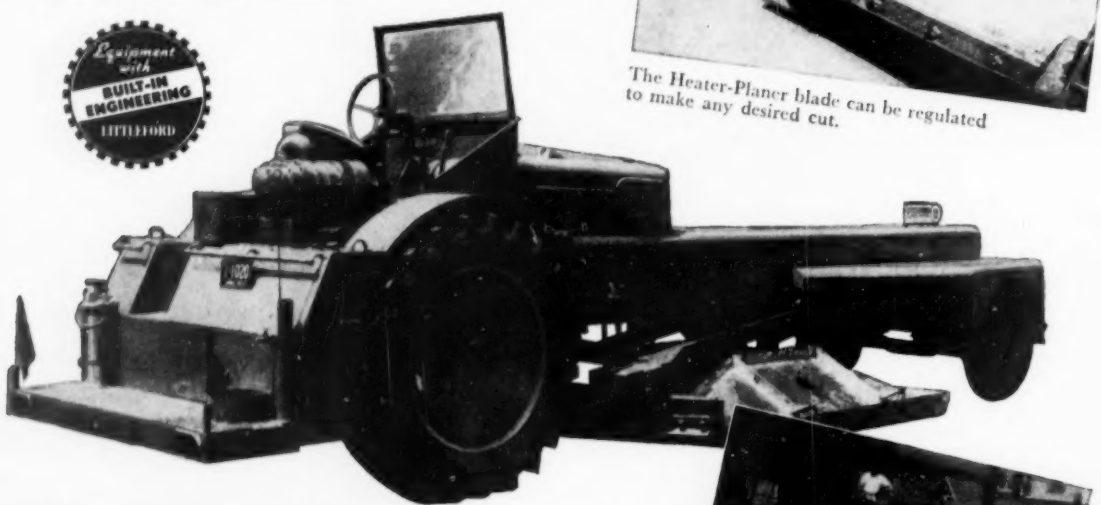
- **Levels rough sections and removes high road crowns.**
- **Eliminates corrugations on hills and at stop signs.**
- **Get's rid of troughs and ruts developed by heavy traffic.**
- **Planes off top surfaces to prepare for seal coating or resurfacing with plant mix or other bituminous materials.**
- **Removes fatty sections or slippery places. Roughs bad hills to avoid skidding.**
- **Provides a level course where settlement of surface makes it necessary to build up.**

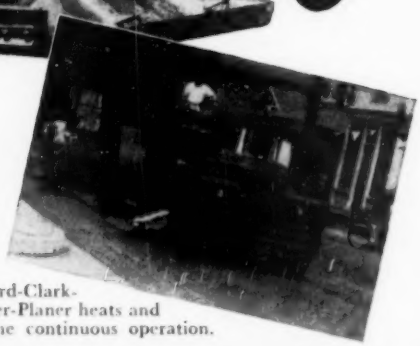
The operation of the Heater-Planer is continuous. It heats and planes as it travels, it's fast and sure. Gives life back to the bituminous surfaces. The reclaimed asphalt can be reused. The Heater-Planer is hydraulically operated, has finger-tip control for operating the blade and surface heater.

For low-cost table-top smooth riding surfaces, the Heater-Planer is the new modern Road Maintenance Unit.

The Heater-Planer blade can be regulated to make any desired cut.

Equipment with BUILT-IN ENGINEERING LITTLEFORD





The Littleford-Clarkmoore Heater-Planer heats and planes in one continuous operation.

Littleford-Clarkmoore Heater-Planer planes off and windrows the material so that it can be easily shoveled into a truck. The crew works behind the Heater-Planer, not out in traffic.

BLACK TOP ROAD MAINTENANCE EQUIPMENT — LB — SINCE - 1900

LITTLEFORD

LITTLEFORD BROS., INC.
454 E. Pearl Street, Cincinnati 2, Ohio

Model 363 shown with car unloader. Lengths to 35 feet. Capacities to 200 tons per hour. Swivel wheels for radial stock piling. Wide range of accessories, including screens.

MOVE bulk materials the cheapest way.

Model 374 shown with flanged wheel for radial stock piling. Available with steel wheels or pneumatic tires. Lengths to 60 feet. Capacities to 430 tons per hour. Wide range of accessories, including vibrating screens.

MOVE sand, gravel, cement, wet concrete, coal, coke, ashes, chemicals — almost any bulk material.

MOVE with machines that are truly portable — easily moved around the yard, or towed on the highway.

MOVE materials continuously with less horsepower, less labor, less cost.

MOVE today toward greater profit.

Let us show you how Barber-Greene can reduce your costs.

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11. Seaco, Incorporated
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16. Wabash Valley Asphalt Co.
Terre Haute, Indiana
17. Brookman Construction Co.
17th & Gharkey Sts., *Muncie, Ind.*
18. Fauber Construction Co.
Lafayette, Indiana
19. Asphalt Materials & Construction, Inc.
960 E. 22nd, *Indianapolis 2, Ind.*
20. Ready-Mix Asphalt, Inc.
P. O. Box 882, *Fort Wayne 6, Ind.*
21. Walsh & Ikeler
R. R. #2, *Gary, Indiana*
22. Bituminous Materials Co.
416 S. Water St., *Jackson, Mich.*
23. Bituminous Materials Co.
318 Atlantic St., *Bay City, Mich.*
24. Emulsions, Inc.
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SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1—Penetration Macadam, 2—Open-Graded Plant Mix, 3— Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching.

K. E. McCONNAUGHAY
EMULSIFIED ASPHALT
Plants and Processes
LAFAYETTE, INDIANA

VIEWS AND COMMENTS

By H. G. Nevitt

Fundamentals Are Important

The authorities and textbooks continually stress the importance to the highway engineer of certain fundamentals. For example, the outstanding need for drainage: any engineer who fails to make provision for it cannot say that the requirement had not been impressed on him.

With flexible surfaces fundamentals are critical, perhaps more so than in many other types of work. Probably this is true because, while these structures are simple in nature and easy to build, they function in an extremely complex manner, so that it is very easy to lose sight of basic needs in attempting to improve details. Of course fundamentals are usually given consideration, but this is not always true. It is possible that they are not always well understood. Certainly the relation between cause and effect, where failures follow this neglect, has not been so clearly demonstrated over the years as in the case of drainage. For these very reasons attention to fundamentals in bituminous work is a serious need.

Cover Many Errors

Many of our readers may not have this conviction to the same extent as the writer. Bitumens are really remarkable materials. They fulfill the rather exacting requirements for any binder needed in a flexible surface, as will be later discussed. But in their functioning they provide a wide tolerance, and show remarkable powers of adjustment to the demands of the actual construction. It is true certainly, perhaps unfortunately so, that this wide flexibility and adaptability of asphalt tends to cover up many errors, or to mitigate them, at least in the early life of the surfacing. There are not many binders that are as easy to work with from this standpoint as asphalt. The bituminous engineers should be thankful accordingly. However, they should not take undue advantage of this help from the material.

There is perhaps another reason for the limited awareness of fundamentals in bituminous construction. Fundamentals not only haven't been too well understood, but the criteria involving them are not well developed. There was some discussion of this point in our September review of the status of bituminous construction. Furthermore, too many design methods are predominantly empirical in nature. The mere following of the criteria is not in itself always sufficient for good work. An example is the trend to high filler contents that followed the development of the Hubbard-Field design method. Since such filler amounts gave high stability, they were resorted to with little thought as to what was happening to the film characteristics and the resultant properties of the mix. Experience has shown the error of ignoring basic needs in these characteristics.

Consider Fundamentals Early

It is our belief that in every design these fundamentals should be considered in the original planning; also that the final decisions should be checked from the standpoint of whether or not fundamental requirements are being met. We think a great many programs would be modified somewhere along the line if such a procedure were adopted.

In view of the importance of these fundamentals, we plan to devote some time to them in later issues. We think that consideration of the basic requirements of a flexible surface, the matter of necessary side support, the control of water by a rational analysis of the possibilities, and some other general aspects involved in these structures as distinct from arbitrary design rules or procedures, warrant attention and discussion.

Emphasis on Methods

This situation is rather interesting; the majority of what might be called fundamental rules or statements do not appear to be formulated (at least explicitly) and fully stated in the literature. The concentration has been almost entirely on the mechanics of the methods advocated, with often little or no discussion of the principles. This does not mean that the text writer is not aware of them. He may sketchily refer to the fundamentals involved; but more often than not, knowledge of them is taken for granted without a complete outlining of the principles on which the proposed procedures, analysis or discussion are based.

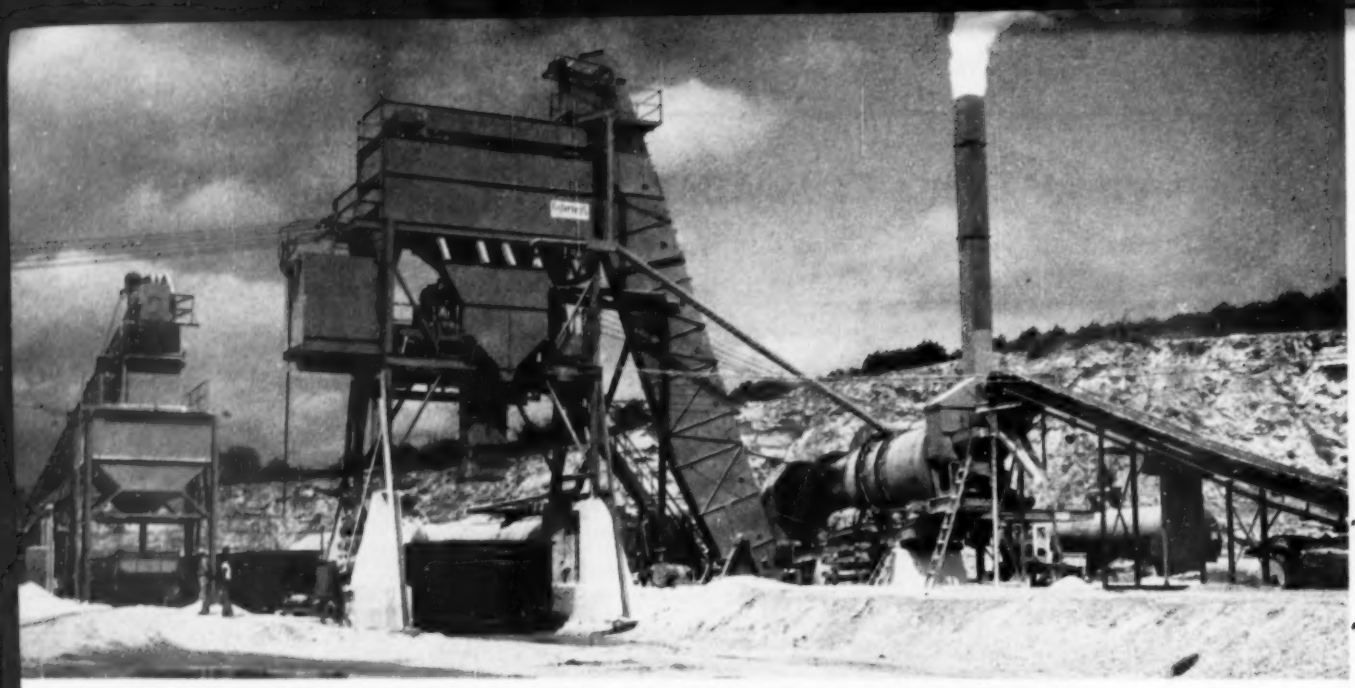
Undoubtedly, every bitumious engineer has his individual concept of the functioning of a bitumious surface and the basic requirements to assure it; but there is too little clear statement of such fundamentals in the literature — or in discussions, where often a clarification from this standpoint would immediately compromise the conflicting points of view. Our attempts in this respect will of course be brief and general; but we hope what we offer from time to time will provoke discussion. If we can get definite agreement on these fundamentals among the experts it will undoubtedly be followed by correspondingly better agreement in the methods, recomendations, etc., originated by them.

We wish to repeat that we do not believe this matter of fundamentals can be given too much emphasis. Engineering involves the application of scientific principle to practice. It inescapably requires that the technical fundamentals concerned be met. They are the base of the design and construction; and we do not need to tell highway engineers that if there is a good base, it will probably not be too difficult to end up with a good road.

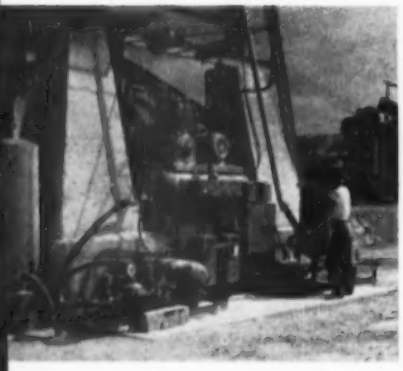
Competition grows keener

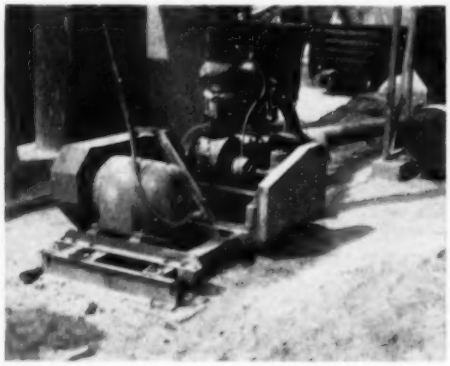
Nine in every ten answers by AGC member contractors to a recent questionnaire foresaw keener contractor competition. Reasons given include: (1) Increased capacity of contractors, due partly to improved equipment; (2) a larger number of contractors in the area; (3) efforts by newer contractors, especially, to meet expenses of equipment and maintain organizations by seeking work at "dangerously low" bids; (4) extremely favorable weather for construction, especially in some sections, which enabled contractors to finish jobs ahead of time and seek more work; (5) entry of out-of-state contractors; (6) "too many contractors."

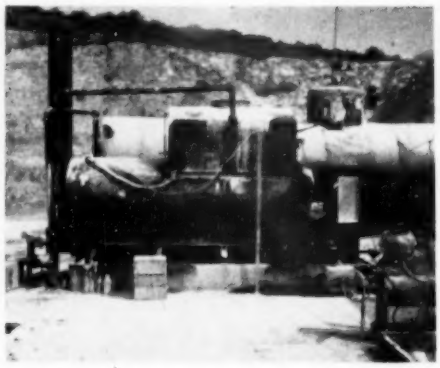
Some replies said the competition was so intense that many contracts were being taken at cost or below. There were many warnings that profits were going out of the contracting business, and that the law of the "survival of the fittest" would be felt.



● The McDonough Bros. plant near San Antonio delivers mix either to rail car or truck. Steam from stack denotes thoroughness of aggregate moisture removal.







● Details of electric controls (left); Viking asphalt pump (center); and Grace hot oil asphalt heater (right).

● Rear view of plant. A by-pass chute is provided at the dryer intake, in event bins are to be emptied for change in mix.

With Editor's Camera

Around McDonough

Brothers Plant

BIG-CAPACITY PLANT SUPPLIES MIX FOR

Both Hot and Cold Delivery

Installation near San Antonio epitomizes Texas trend toward long range delivery of asphaltic mixes by rail or highway from fixed asphalt plants, usually operated in conjunction with a commercial quarry.

TEXAS bituminous work these days is being served by a number of new asphalt plants, designed to produce hot asphaltic mixes for either hot or cold delivery. Rail delivery for distances up to 300 miles or more is part of the picture.

The plants, which in many instances are permanently set at a commercial quarry, represent a new evolutionary step, following the widespread introduction of hot mixes in Texas during the war years. Before the war most Texas bituminous road work consisted of surface treatment or blade mix, which types, especially the surface treatment, of course continue to be widely used.

A case example of such an asphalt plant is a new establishment of McDonough Brothers Inc., of San Antonio, Texas. This firm, a leading aggregate and asphalt mix producer of the area, early in 1954 installed a Cedarapids Model G60 180-ton-per-hour plant at its quarry 12 miles northwest of San Antonio.

Fully Automatic Control

The plant includes fully automatic electrically controlled batching and mixing unit operation. Following are the chief elements which are of Cedarapids design except where otherwise noted:

1. Two 2-compartment charging hoppers of 30-ton capacity each, (Model 30S) with steel apron feeders for delivery to the mixer via a 34 ft. x 100 ft belt. Hoppers are fed from a high-level concrete floor, as pictured. A by-pass chute is provided at the discharge of the conveyor and intake of the drier, as shown in the photograph, in the event it is desired to empty bins because of change in type of mix and aggregate. The arrangement of bins is designed for easy turning and backing in of several delivery trucks simultaneously.

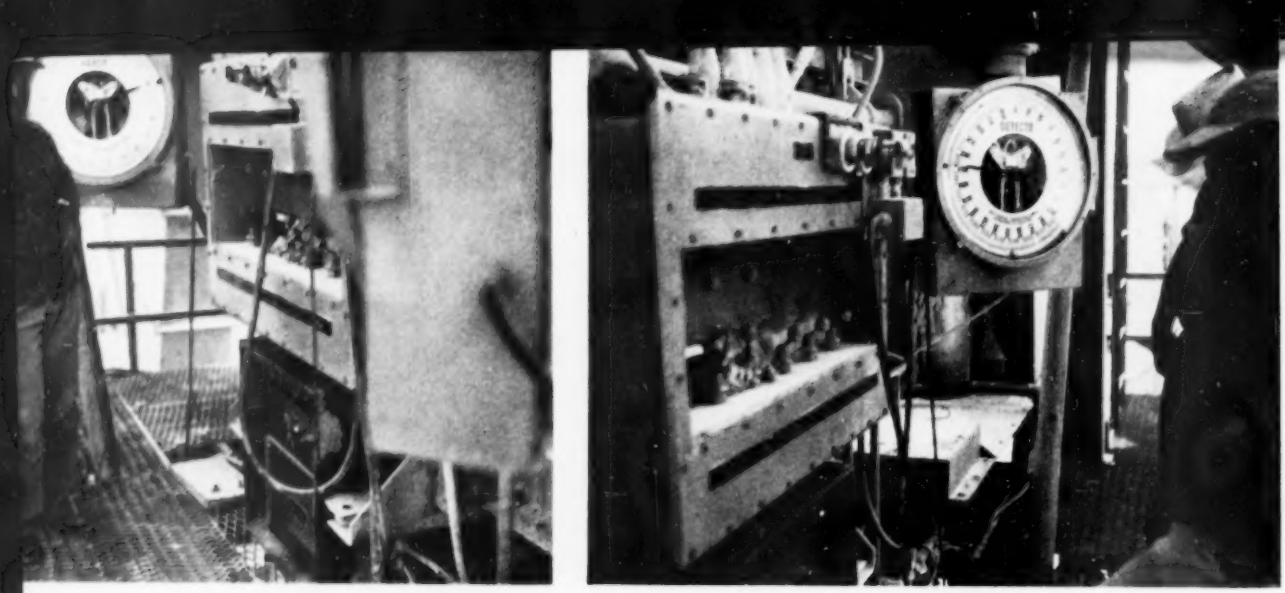
2. A Model G60-E mixing unit with a 6,000-lb. pugmill capacity. The mixer discharge spout delivers into either gondola cars or trucks. Aggregate and asphalt weigh batchers are both equipped with a Detecto scales. Proportioning and timing are automatically controlled from a Hardy Control Panel, and the mixing unit may be operated fully automatic or manual pneumatic. Fully automatic controls assures positive precise mixes, with up to 10 per cent more production than manually operated controls. Switches and other electrical equipment of General Electric manufacture are housed, in part, in a weather and dust proof switch room located on the control desk.

3. Model 8828-E drier, 88-in. diameter by 28 ft. length drum. Bunker C fuel is used in a Maxon 12-in. combination low pressure air atomizing oil and gas burner with a centrifugal blower.

4. DS-88 dust collector of the dry skimmer type.

5. Grace hot oil asphalt heater, size No. 2.

● Two views of the asphalt storage tanks, showing earth blanket designed to aid temperature control.



● A Hardy automatic control panel and Detecto scales for both aggregate and asphalt weighbatching, are features of the plant.

6. Auxiliary equipment includes a Viking asphalt pump, Foxboro temperature recorder (furnished by the Iowa Manufacturing Company as part of the plant), three 10,000-gal. asphalt storage tanks, one 10,000-gal. fuel storage tank.

The hot mix plant is located immediately adjacent to the company's large capacity limestone quarry and aggregate plant, and in fact, uses a common rail spur for gondola take away.

A separate, smaller fixed type aggregate plant, however, has been set up for use especially in producing highway and other paving aggregates, either for direct delivery to customers or for supplying the asphalt plant. This plant is a Cedarapids assembly consisting of a feeding hopper; belt; horizontal triple deck screen; oversize chute to a small hammermill; return belt; and a 30-ton delivery hopper for truck take away. Two Koehring Dumptors supply stone, either from the quarry or from stockpiled material that can be used economically with modification.

This asphalt plant arrangement has a good many advantages, upon close analysis. Since it is adjacent to both a big commercial quarry and a special road stone plant, aggregates for almost any conceivable asphaltic mix can be supplied to the mixer on short notice. The three storage tanks permits stocking of three asphalt grades.

As a result, the company with quick change-over can supply mix for various state highway specifications, for airfield and other extensive military establishments of the San Antonio area, for county and city work and for private industrial drives, filling stations, parking lots, and the "grocery trade" generally.

At the time the ROADS AND STREETS Editor visited the plant, hot mix was being produced and delivered into rail cars for cold delivery to a state road job 300 miles distant. The economics apparently are such that in this locality, cold mixes can thus be supplied at a price sufficiently low to encourage the use of such mixes in highway work, and frequently to make it unjustifiable for the contractor to set up an asphalt plant on the job.

A typical hot-mix, cold delivered asphalt for state roadwork consists of a mix with 210-250 penetration asphalt cement. A slight amount of water or primer or both is added in the mixer by means of a standard Cedarapids attachment to facilitate unloading handling, stockpiling and placing. Cold mixes are used for resurfacing projects where traffic is not too heavy, for patching and shoulder maintenance and for various urban supply.

● High-level charging hoppers, with paved dumping floor.

Texas "Specs" on Cold Laid Mixes

"Hot mix cold laid" is a bituminous concrete paving mixture which, as its name implies, is mixed hot but laid cold. This mix was developed in Texas to fill a need for a bituminous mix that could be mixed at a central mixing plant and shipped to the job ready for use, either in construction or maintenance work. The mixture resembles hot mix very much. The aggregate is heated and a penetration grade asphalt usually by 230 penetration is mixed with the heated aggregate. A fraction of a per cent of a primer is added to the mix and water in the amount of approximately 2 per cent is then added to the completed mix. The purpose of the water

Etnyre pays off for Westchester Asphalt Distributing Corp.

Celebration of a 25th anniversary this year caused executives of the Westchester Asphalt Distributing Corporation of White Plains, New York to check up on a quarter-century of progress.

An inventory of equipment revealed a fleet of twenty-three Etnyres — twenty "Black-Topper" Distributors, and three Hauling Tanks. Pictured above are sixteen units in the Westchester fleet.

A faithful user of Etnyres since he started in business, President William H. Peckham points to accurate distribution, dependable performance, and economical operation of "Black-Toppers" as reasons for his loyalty to them.

Our hats are off to the Westchester organization in a salute to twenty-five years of business success, and we extend best wishes for continued growth in the next quarter-century.

To get the complete story on why Etnyres make such loyal friends among owners everywhere, see your nearby dealer or write E. D. Etnyre & Co., Oregon, Illinois.

SEE YOUR ETNYRE DEALER

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

● (Left): Stockpiled stone being reloaded with a Hough loader for delivery to the charging hopper (Right): Foxboro temperature recorders, with glass dust protector, located on ground near the mixing tower.

is to prevent the mixture from setting up in transit. The purpose of the primer is to prevent the asphalt from stripping from the surface of the stone when it comes in contact with the water. A true hot mix cold laid is mixed at a central mixing plant and shipped to the job ready for use. If a contractor elects, however, he may set up his own batching plant and make the material. In this case he would not add water or primer and the resulting mixture would be handled the same as hot mix asphalt concrete and would be placed hot.

Cold Laid Operations

The material mixed at a central mixing plant is shipped to the project where it is unloaded directly into dump trucks, weighed and hauled to the job site. In placing cold mix materials it is common practice to apply a tack coat down the center of the road when the material is to be dumped on the center of the road. In some cases job conditions are such that it is desirable to dump on one side of the road. In any case, the tack coat should be applied only on that part of the road on which the material is to be dumped. In no case should the application of tack coat be more than .05 gallon per square yard. Common practice of contractors is to haul and dump on a road for one day. The following day the hauling operations are continued and the material hauled the first day is evened up into a uniform windrow. The remaining areas of the roadway are then tacked. This method of application of tack coat is desirable when placing cold mixes in that it eliminates killing of the tack by dust due to traffic traveling on the shoulders of the road.

In placing any type of cold mix it is highly essential that the mixture be properly aerated; that is, the water and hydrocarbon volatiles must be removed from the mixture. Experience has taught us that we should never seal in more than 0.5 per cent of hydrocarbon volatiles and/or moisture when laying hot mix cold laid. The operations for aerating a cold mix differ among contractors. As a rule a land consists of one day's haul operations, the building of the windrow, the splitting of the windrow and carrying half to each edge of the pavement. These are aerating operations and under normal weather conditions a great deal of aerating takes place. The material is then drifted across the road in small lifts and additional aeration takes place. The inexperienced inspectors can secure samples from the road at the time he thinks the material is ready to "set down." Tests can then be run for moisture and hydrocarbon volatile content. By making a few tests the Inspector will soon be able to correlate the per cent of moisture and/or hydrocarbon volatiles in the mixture with his judgment which may be based on fuel, the way the material looks, smells or even tastes. The blading operations should be followed with a pneumatic tired roller and when material is to final shape and grade and ready to be "set down" it should then be given its final rolling with the steel rollers.

A surface that has been placed with a motor grader after being under traffic for a short time soon irons out and has a very pleasing and non-skid surface. The Road Inspector should watch very carefully for spots that have pulled under the blade or that have become seggregated. These places should be removed and replaced with satisfactory material. Traffic will never iron out a pot hole, a nest of coarse aggregate or a blade streak placed in by careless maintainer operator. These places should be carefully watched by the Inspector and repaired before the final rolling. The edges should be straight — built to a string line.

Army engineers develop new lighting sets

Of interest to contractors who have many war-time GI lighting units are the three improved lighting equipment sets developed by the Electrical Engineering Department of the Engineer Research and Development Laboratories, Fort Belvoir, Virginia.

Now standard, the new 1½ kw., 3 kw. and 5 kw. sets are lighter, more durable and more easily transportable than the World War II equipment they replace. The largest set can be assembled by two untrained men in 75 minutes and disassembled in 65, where five and ten hours respectively were required for assembly and disassembly of the old equipment. The modern design of the new sets eliminates the necessity of splicing, pole climbing, insulators, plug and receptacle wiring and tools. Where possible, sockets, lamp holders, plugs and receptacles have been made part of the cables and lamp cords.

Perfect interchangeability between sets, of components and containers, has been achieved. All the carrying chests are fabricated of magnesium or plywood, and each chest, sufficient in itself to establish a lighting system, contains the same kind and number of components.

● The Texas Highway Department has received the Award of Honor, highest safety award of the National Safety Council. This citation for accident prevention achievement was given for a 79% improvement in the accident severity rate over the average for the previous three years, the department's accident frequency rate among employees being 11.4 with a severity rate of .83 (the latter figure representing number of lost days per 1000 man-hours of work).

How Can Engineers Keep Up? One Answer:

Let's Have More Short Courses

By Ladis H. Csanyi
Professor of Civil Engineering
Iowa State College, Ames

HOW can a practicing highway engineer keep up with, evaluate and integrate all of the new ideas, methods, materials and machines that are continually being developed in his field, and how can he properly apply these to his work?

This is probably the most perplexing and frustrating problem that an engineer faces. There are so many conflicting aspects involved in the problem that each engineer must solve it in his own way if he is to keep up with both his job and the times. Where can he turn for assistance

Information on the new developments may be secured in several ways. One of these is by reading and studying all the articles scattered throughout the many professional journals and proceedings, research reports, periodicals and equipment catalogs. But how many engineers have access to all these publications? Where would he find the time to read them all when he seldom finds time to read even the few publications he has at hand. Obviously some means must be devised whereby the majority of the engineers may have access to most of the major developments in a form which they can review rapidly.

Abstracts a Source

"The Highway Research Abstracts" published by the Highway Research Board has made a start in this direction. This monthly publication contains abstracts of recent findings and developments, and gives the reference to the specific article or paper if further details are desired. This is an excellent source of information but it needs to be expanded and made comparable for instance to the "Chemical Abstracts" published for the chemists. In "Chemical Abstracts," articles are not only abstracted but are classified and grouped under subject headings. Such compilation materially assists and saves considerable time in following, learning of, and tracing back developments in specific areas. It also helps an engineer to find and concentrate on specific areas of his field in which he is particularly interested. A similar trend in abstracting and compiling information related to equipment has been undertaken by some publishers. A file of construction equipment published annually by "Roads and Streets" Magazine contains abstracts and equipment catalogs in a handy reference form showing present developments and application of various road construction equipment. Such trends in abstracting and compilation of information concerning new developments are invaluable to an engineer in his efforts to keep abreast of the times.

But reading is not the only way of securing information on new developments. Another way an engineer may acquire such information is by attending the meetings of professional societies of both national and local levels. Attendance at such meetings affords an excellent opportunity not only to discuss new developments but also to exchange ideas and experiences. Unfortunately, only a small portion of the engineers can find the time and means of attending the annual meetings of the national societies. A much larger portion, however, can and do attend meetings of local sections of national societies and other meetings of local groups such as County Engineers and Road Conferences. One unfortunate tendency which is developing in the conduct of these meetings that may adversely affect their usefulness, is the attempt to cover so many topics that the time allowed for any one is so short that no useful information can be properly presented. Also very little time is made available for personal discussion and exchange of ideas and experiences. Unless these annoying circumstances are guarded against meetings as such lose their value.

To meet these needs and perform such services many colleges and universities have developed concentrated Short Courses, in which a single subject is treated. These short courses are presented by faculty members and should be distinguished from short courses in which papers are merely presented. Thus, the courses are given at college level and include a brief review of the subject leading up to new developments. In discussing new developments, all new developments are coordinated in relation to each other. Various papers pertinent to the subject are discussed and integrated into the over-all progress. They are also interpreted and applied to practice. By attending such a short course an engineer may, in a few days of concentrated study, get a clear, concise picture of the new developments in that particular field.

Iowa Short Courses

In Iowa this need was recognized some time ago and several short courses were sponsored by the Iowa County Engineers Association and presented by the Engineering Extension, in cooperation with the Civil Engineering Department of Iowa State College. These short courses entitled "Principles and Practices of Highway Engineering Materials, Design and Construction" include specific courses on Bituminous Paving, Soil stabilization and Engineering.

The Bituminous Paving section

Short Courses Fill Real Need

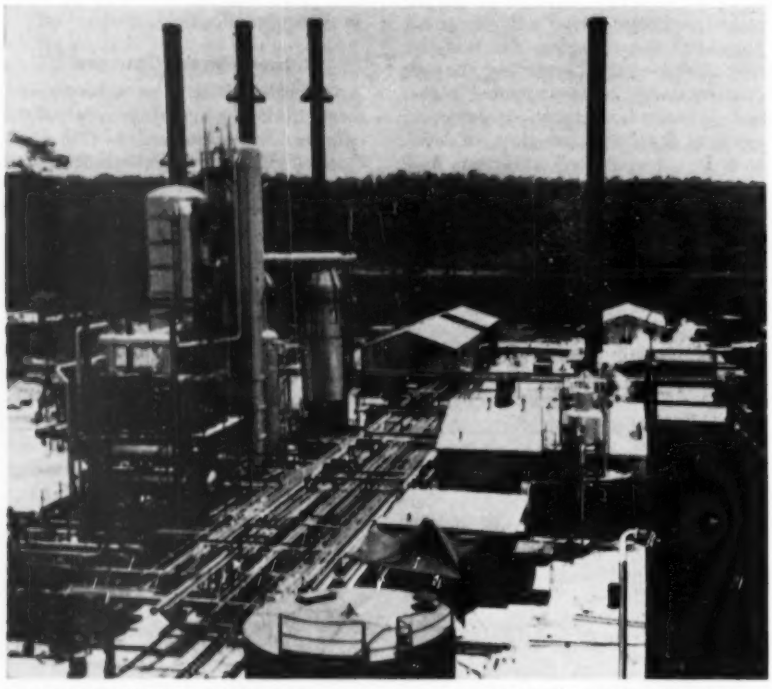
Although the reading of papers and attendance at meetings help an engineer keep abreast of the times, they still fall short of meeting his needs. Technical papers always deal with specific problems and seldom if ever devote enough space to previous developments. True these are covered in references, but this does not help the engineer who must chase down all these references to get a complete picture of the development. Authors of technical papers are prone to use highly technical language and highly technical and lengthy mathematical derivations to prove their theories. This is splendid for the research man but extremely discouraging for an engineer who is interested in knowing what it is all about and how he can use it. Consequently, technical papers frequently require translation or interpretation into readily and easily understandable language, and correlation and integration into the engineer's working knowledge.

consists of a sequence of three separate but integrated courses on Bituminous Materials, Bituminous Mix and Pavement Design, and Bituminous Paving Construction Methods. The Soil section consists of a sequence of two courses on Principles in Soil Stabilization and Soil Engineering and Construction Practices in Soil Stabilization and Soil Engineering. Each course is of three days duration, class being conducted from 9:00 a.m. to 5:00 p.m. each day. Upon completion of each course, certificates of attendance are awarded. The courses are given in the late fall, winter and early spring so that they do not interfere with the regular routine work of an engineer. They are open to all engineers in highway work.

To indicate the specific contents of the courses the Bituminous Paving sequence is used here as an example. In the first course of the sequence, Bituminous Materials, a brief review of the various bituminous materials used in highways is given, including their source, manufacture, tests, significance of tests and their uses. Following this, new methods of tests on recognized materials are discussed together with the study of new materials used separately or in conjunction with the old. Uses of admixtures such as rubber and wetting agents and others are also considered in their relation to and affects upon the materials and mixes. The second course, Bituminous Mix and Pavement design, which can be taken only after the first has been completed, includes a review of present practices followed by the discussion of new concepts in mix and pavement design and their relation to practical applications. The third course, Bituminous Paving Construction Methods, taken upon completion of the first two includes a review of present practices followed by a study of new equipment and methods and their practical applications. These courses not only refresh an engineer in the usual practices but also bring to his attention all the new ideas, methods and practices in such a way that he can understand, correlate and integrate them to his working knowledge.

The courses presented the past two years have proven so popular and well received that their repetition has been requested; and, it has been suggested that other similar courses on Surveying, including photogrametry, Modern Highway Design and Bridge Design be instituted.

New Asphalt Refinery on Ohio River



● A new $4,000,000 asphalt refinery is in operation at Columbia Park, Ohio, by the American Bitumuls & Asphalt Company. Located on the Ohio River near Cincinnati, the plant will refine and manufacture standard grades of asphaltic products for regional distribution. Covering 100 acres, the facilities include complete refining, storage, and shipping installations; testing laboratories and storage capacity of 45 million gallons.

Old curves built to proper super-elevation

The editor of ROADS AND STREETS recently snapped the cover scene reproduced as the Bitumionus Roads and Streets "cover" picture for this issue. A query to F. L. Ashbaucher, engineer of road construction, Indiana state highway department, brought the following comment on Indiana's program of resurfacing to which this picture pertains:

● Widened pavement being checked for placement of super-elevation wedge courses.

"Many miles of old pavements, which we are now resurfacing, were constructed in accordance with curve super-elevation standards that are now obsolete. It is our present policy to correct these deficient super-elevations as a part of the resurfacing project.

"Prior to construction, the Department's engineering force determines the super-elevation deficiency and establishes a new grade line for the outside of the curve relative to the inside edge of the existing pavement.

"To obtain the necessary stability, due to the excessive depth involved, the use of a bitumionus mixture using 1½-in. top size coarse aggregate is specified. This mixture is placed in courses, the maximum thickness of any individual course being limited to twice the top size of the coarse aggregate used. In many cases, it is necessary to build up the outside edge as much as 1 ft.

"I am enclosing a negative (picture also reproduced herewith) showing a pavement which was first widened with cement concrete. You will notice that the outside edge of the widening has been constructed to a new grade line; approximately 9 in. above the edge of the old pavement. The resulting flat "V" shape trough will be filled with a series of wedge courses; upon which will then be placed the normal binder and surface mixtures."

Water—the No. 1 enemy of asphalt road patching and surfacing—is quickly put on the run with Pave.

During wet, damp weather asphalt patches and surface treatments are put down to stay when the mixes and liquid asphalts contain Pave. After asphalt is laid Pave prevents stripping. Increase the number of days you can lay asphalt by using Pave, and permit your road crews to lay more asphalt during the off-season.

In winter stockpile mix and hot asphalt surfacing materials, Pave is effective and economical, because Pave is not destroyed in asphalt. Pave pours easily at cool temperatures and blends readily into all asphalt materials.

For the descriptive Pave brochure and specific information on your problems, write today!

***How PAVE Overcomes Wet Conditions...**

Asphalt laid on wet road surfaces can not give the best service, since even a thin water film prevents asphalt from holding to roads.

Pave-treated asphalts remove water from road surfaces allowing the asphalt to bond firmly to the dry surfaces. The result is road paving that lasts.

Carlisle Chemical Works, Inc.
Reading, Ohio

Manufacturers of fine industrial chemicals

PAVE HEAT-STABLE

Getting a Good Lay-Down on Asphalt Pavement

Continuing with comments on this subject by state highway department leaders. First article appeared in August.

By G. A. Meskal

Assistant Maintenance Engineer
Minnesota Department of Highways,
St. Paul

Best results are obtained when a "hot" joint is constructed. By this we mean that successive paving strips are laid before the previous one has had a chance to get cold. In cases of multiple lane paving commonly encountered in urban construction, it is good practice to complete the paving the full width as near as is practicable. In doing so, not only is a "hot" joint obtained but the exposed longitudinal edge of the mat is subjected to traffic for a shorter period of time.

In order to insure proper density, the surface of the mat placed should be higher but not to exceed ¼ in. after compaction than the surface of the strip against which it was placed.

In the case of multiple lane paving, the paving should proceed from the gutters towards the center. In this manner, stepped-down joints towards the gutter are obtained, thus eliminating the accumulation of water along the joint.

The initial rolling should be accomplished as close up behind the paver as the mixture will permit. Density is obtained mostly in this initial rolling if done at the right time. Subsequent rollings, while they contribute additional density to some extent, are for ironing out the surface.

Stopping the roller on a fresh laid mat produces roughness. During the initial rolling of the first strip, planks, the thickness of the mat, should be provided in order to move the roller off when not in use. In rolling the second or subsequent strips, the roller can run over on the strip in place. Stopping to back up during the initial rolling produces a slight ripple in front of the rollers. If when stopping, the roller is turned at an angle, this ripple will not be at right angles to the center line and will roll out much easier with subsequent rollings. Experienced roller operators are the key to good riding surfaces.

About the only time pneumatic tired rollers are used in plant mix construction is in blade spreading leveling course and bituminous base mixtures. In these cases, if the rolling is done simultaneously with the spreading, density is obtained from the bottom up and in doing so, a good uniform surface is obtained.

It goes without saying that the finishing machine should, at all times, be in good mechanical condition and operated by an experienced operator. One, and preferably two, good men should be handling the screws on the rear end of the paver to avoid any sudden changes in elevation of the screed. Sufficient labor help should be available at all times during paving operations. Use of rakes behind the paver should be held to a minimum. Experienced truck drivers contribute to a smooth riding surface.

Good or poor riding qualities are the result of a number of conditions.

1. Truck drivers on mix delivery.
2. Condition of finishing machine.
3. Efficiency of operators on finishing machine.
4. Workmanship of crew behind paver.
5. Mechanical condition of rollers and efficiency of roller operators.
6. Mix design.

By Vernon B. Gould

Assistant Bituminous Engineer
Iowa State Highway Commission, Ames

Generally speaking, we consider that basic requirements for good asphalt paving workmanship may be briefed as follows:

1. Adequate and modern construction equipment in good working condition and properly serviced.

2. Key contractual personnel experienced in hot-mix construction, alert to the possibilities of improved construction methods and procedures, cooperative beyond strict specification requirements and imbued with a sense of pride in a job well done.

3. Engineering and inspection personnel experienced in hot-mix construction and in dealing with contractual personnel, alert to the vagaries of hot-mixes as affected by changing atmospheric temperatures and humidity, aware of the necessity for close temperature and gradation control, cooperative, specific but pleasant in instructions to contractual personnel, and emotionally stable.

Such rollers are not well adapted to hot-mix construction but may be used advantageously for the compaction of leveling courses and tightly sealing the surface of late season construction in lieu of bituminous fog seals. Presently self-propelled units of this type are not generally available commercially. The relatively high temperatures desirable for satisfactory compaction are detrimental to the unit.

A joint not "noticeably visible" to the public is desirable and such joint will normally incorporate the essential characteristics of a good joint — waterproof, nonspalling or scaling and with good riding qualities. Factors involved in securing such a joint we believe include straight lines for the mat edge, close control of the depth of loose mix, approximately a two-inch overlap on the first lane mat, minimum but expert care in the displacement of loose material from the overlap by the raker, and timely and careful rolling by an experienced operator. With respect to displacement of the loose material from the overlap, we consider a forward and upward movement of the rake with tines down, followed by a short forward and upward movement with the back of the rake will normally be adequate. Occasionally crumbing the loose material on the overlap with a flat shovel after raking may be required.

Preferably initial rolling should follow closely after the paver and final rolling should follow initial rolling with minimum delay. To permit this, the temperature of the mix at the plant should be controlled to permit delivery to the paver close to the established rolling temperature. This will require close cooperation by the plant superintendent as the specification tolerance of 20 degrees from the temperature established by the engineer is too broad to permit close follow-up rolling. In general, a temperature of 250 degrees at the paver will permit close follow-up rolling but sensitive mixes, high air temperatures and humidity will require adjustment of operating temperatures.

Specifications require that initial contact with the hot mixture shall be with the power or driving roll. A one-half lap of the roller is required as the rolling progresses from the outer to inner edges of the mat. Since the roller must move forward and backward in the same line of travel before offsetting, much of the mat has four coverages of the roller during initial compaction. Perhaps this will explain why it is seldom difficult to secure the desired density. In some instances the four coverages for initial compaction may constitute over-rolling and rolling procedures may be modified.

What's New
in Equipment and Materials

(Continuing from pages 84-92)

"Airomixer" for Traffic Line Paints

Wald Industries, Inc., Huntingdon, Pa., announces the "Airomixer" as an accessory for the Wald "Reflecto-Liner" striping machine. Operating on air power taken directly from the striper, the device may be used conveniently on the job or at the base of operations.

Mixing is done with a suction type impeller.

Automatic Leveling Tool

A new automatic leveling tool, the Cowley Compactic automatic level, is being introduced by Engis Equipment Co., Compactic Division, Chicago, Ill. Its patented optical principle employs no cross hairs, bubbles or leveling screws. No focusing is necessary. The camera-sized unit need only be placed on its light yet sturdy tripod or wall-top stand to indicate automatically whether the target is level. The instrument is permanently adjusted, ready to use, practically free from wear. Complete information, including descriptive literature, operating instructions, and a service guarantee form, are available from Engis Equipment Company, Compactic Division, 431 S. Dearborn St., Chicago 5, Ill.

Cowley Compactic Automatic Level

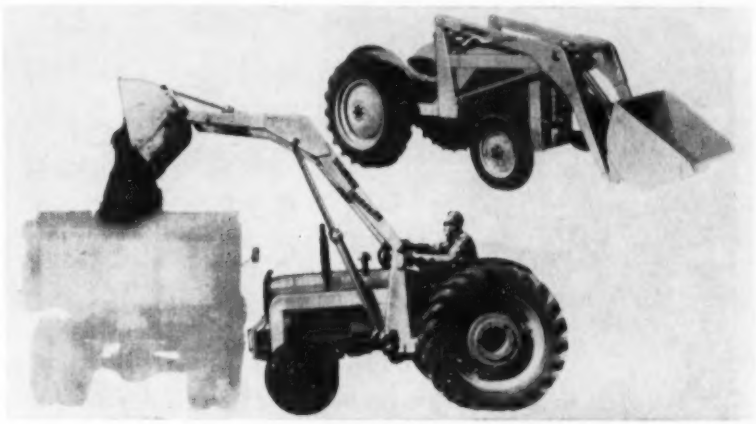
Electronic Scale Weighs Trucks in Motion

A new type of electronic highway scale which weighs and records both single and dual axle truck weights while vehicles are in motion, has been developed by Cox and Stevens Aircraft Corporation, Mineola, N.Y., an affiliate of Revere Corporation of America, Wallingford, Conn. Drivers will not know when or where this weighing takes place. This factor makes the equipment particularly useful for highway research purposes, and also for enforcement of maximum load regulations. Known as the TR-1 unit, the electronic highway scale has been under test by the Bureau of Public Roads near Washington, D.C., for two years.

First installations of the unit, now being made in Oregon, and Iowa are expected to be completed this fall. The highway part of the unit consists of a narrow level platform in the traffic lane, just wide enough to catch each wheel of the axle. This platform, 3 ft. by 10 ft., is supported by electronic weighing cells capable of accurately and instantly transmitting the weight to a remotely located indicator where the weight is recorded automatically.

Two New Front End Loaders

Two new heavy duty loaders, the "Loadmaster" for larger tractors and the "Special" for smaller tractors are now in production by Shawnee Manufacturing Co., Inc., 1947 N. Topeka Blvd., Topeka, Kans. The basic design for the Loadmaster has been made on the Ford-son major diesel tractor, whereas the basic design on the Special has been completed for all of the Ford and Ferguson model tractors. Available soon will be these loaders for other make tractors of comparable size. Both models are of all welded construction and feature a two pin installation for removal which can be accomplished in less than ten minutes. They are designed free of bolts, with double acting cylinders throughout, and an oversize hydraulic system claimed to assure greater working ability and longer life.



Loadmaster and Special Models Front End Loaders

Portable Single Pass Crushing Plant

A newly designed single pass portable crushing plant for producing two sizes of low-cost gravel or rock on jobs where material does not have to be accurately graded has been announced by Iowa Manufacturing Co., Cedar Rapids, Ia. This new Cedarapids single pass plant consists of a 6 ft. x 6 ft. loading hopper equipped with sloping bar grizzly with 7 in. openings; an 18 in. reciprocating plate feeder with adjustable feed stroke and feed gate; a 2 ft. x 6 ft. double deck Model "H" inclined vibrator screen; a 10 in. x 24 in. roller bearing jaw crusher; 24 in. x 25 ft. channel frame delivery conveyor; 14 in. x 20 ft. sand conveyor; and 36 HP gasoline engine: all mounted on rubber-tired full-trailer, goose-neck type with upper fifth wheel plate.

The entire plant weighs approximately 24,500 lb. Oversize that will not pass through top deck of the screen drops into the jaw crusher and crushed material is discharged onto the delivery conveyor. Material that passes through the top deck falls directly onto delivery conveyor.

Cedarapids New Portable Single Pass Plant

Best way to achieve SPECIFIED DENSITY in

ROCK, SLAG, SOIL-BOUND MACADAM, GRAVEL and SAND BASE COURSES

use...

JACKSON VIBRATORY COMPACTORS!

On jobs such as this, soil-bound macadam — 5 inches thick, the JACKSON MULTIPLE COMPACTOR, *now more powerful than ever*, achieves specified density in JUST ONE PASS. It is equally efficient on rock, or slag base and all other granular soils.

Quickly adaptable to widening, the JACKSON MULTIPLE COMPACTOR is shown here consolidating slag macadam base course 36 inches wide and 9 inches thick. Using three of the machine's powerful compactor units in tandem, it readily obtains specified density in ONE PASS.

Twin hook-up of manually guided JACKSON COMPACTORS consolidating gravel base for a large pavement repair area. These machines, used singly or in tandem, or side-by-side twin hook-ups, are exceedingly efficient for all types of granular soil base and fill compaction; also for bituminous patching and driveway construction. Operated from a trailer-mounted JACKSON POWER PLANT which may also be used for other power tools and lights.

See your Jackson Distributor or write to us for complete information on these machines.

JACKSON VIBRATORS, INC. LUDINGTON, MICH., U.S.A.

New Type Trencher by Auburn

"Jeep-A-Trench Gear-Draulic" is the name given to the first gear driven trencher with gears running in oil. The design has been streamlined so that the unit is well forward in the Jeep body over the frame. Moving the center of gravity ahead places more weight on the front wheels making for better traction, straighter trenches, improved steering and roadability between jobs, and much less stress on the frame.

The Jeep-A-Trench Gear-Draulic

Engine power is transmitted through a new gear drive connected to the Jeep center power takeoff, supplying power to the digging ladder. An exclusive hydraulic drive provides a forward speed infinitely variable from zero to fully engaged, and oil-cushions the shocks of changing soil conditions. The Gear-Draulic will handle trench widths from 6 to 14 in. and any depth up to 6 ft.

Manufactured by Auburn Machine Works, Inc., Auburn, Nebraska.

Rotary Plow for Front-End Loaders

A new rotary snow plow that mounts easily on most wheel-type tractor front-end loaders, replacing the loader bucket and using the same pins, has been introduced by the Wm. Bros. Boiler and Manufacturing Company, Minneapolis, Minnesota. Known as the Bros Series "A" Rotary, the unit operates on only 30 h.p., and will plow as high as front-end loader arms can be lifted.

Bros Series "A" Rotary

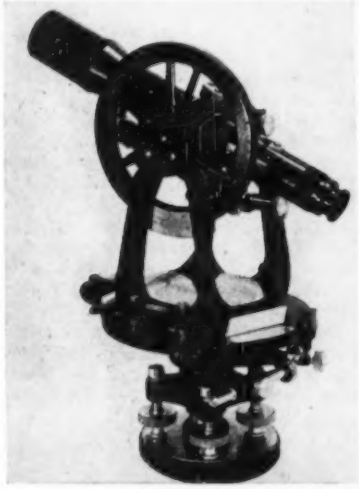
Statement is made that this plow will cast snow at a rate of three to four tons a minute. The exclusive slit-spiral design of the rotor slots makes it possible to handle wet-chunky or hard-packed snow easily. A casting chute extension makes truck loading a simple operation, and because the operator can rotate the chute

180°, truck can be loaded on either side or dead ahead of the plow, an especial advantage in narrow streets or congested areas.

The plow is offered in three plowing widths—4 ft. 4 in., 5 ft. 6 in., 6 ft. 6 in. It is also available for mounting on four-wheel drive Jeeps and can be furnished with special hitch applications.

Imported Transit Weighs 9 Lb.

A new, lightweight, imported transit is now available in the United States. The Umeco Model 100 5-in. survey transit weighs only 9 lb. and is stated to be ideal for work in mountainous country and for contractors needing a precision instrument on construction work. This instrument has a 5-in. diameter horizontal circle and a 4½-in. diameter vertical circle. Both read to 30 minutes and have verniers reading to 1 minute. The 9-in. telescope has a 23 power magnification and is equipped with stadia lines at a fixed 1:100 ratio. The transit is made in Japan under American supervision and to American standards. The instrument is tested and adjusted by responsible agencies before being shipped from overseas and after arriving in the U. S. it is sold under a full money-back guarantee by Umeco Optical Division, 465 California St., San Francisco, Calif.



Umeco Model 100 Survey Transit

Power Steering Unit for Motor Graders

A full-time power steering unit for "Caterpillar" motor graders has been developed by Rivinius, Inc., Eureka, Ill. To be sold only through "Caterpillar" dealers the unit will install for a total price of less than $300, the Rivinius announcement states. "Cat" graders in the 12 and 112 (including the 9K) series can be fitted with one of two models of Rivinius power steering.

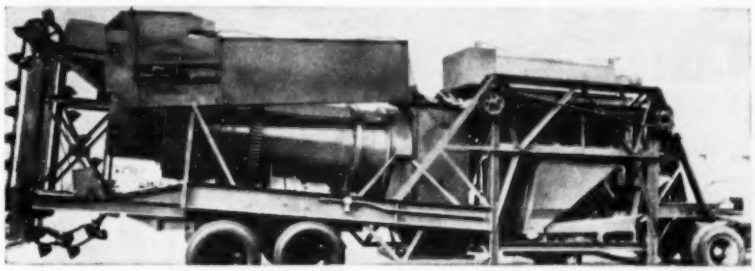
The unit consists of a Vickers hydraulic pump; a cylinder mounted on the front axle and controlled by a valve on the steering shaft. The high location of the valve keeps it out of the dirt for trouble-free operation. All the power to turn the wheels is supplied by the pump;

Announcing A NEW STANDARD

PORTABLE BATCH TYPE ASPHALT PLANT

(MODEL TM)

At last . . . a completely portable *batch type* asphalt plant . . . designed to meet the demand for a plant portable enough to move economically yet provide the capacity and accuracy required for specification work. Capacity is 40 to 50 tons per hour. Ordinarily operated by one man. The exclusive STANDARD "Self-Lift" erecting device elevates the mixing cage in as little as 30 minutes. Fast dismantling, hauling and erecting eliminates need for long, expensive asphalt hauls.



HAUL IT *Anywhere!* Perfect for rural areas . . . for hard-to-reach locations, for state highways and county and township roads. Truck tractor hauls plant easily. Now you can profitably handle jobs that size and distance formerly eliminated or made extremely expensive.

READY for OPERATION— *In A Few Hours!*

The push button operated "Self-Lift" *automatically* raises or lowers the mixing section in minutes. The entire unit, including cold and hot elevator, can be put in working position in as little as 2½ hours. Estimated erection or dismantling time for complete plant, including boiler and storage tank, is approximately one day. Built for years of the most rugged service, the STANDARD portable plant will stand up under both heavy asphalt production and the added stress and strain of constant erection, dismantling and road shock.

Send today for bulletin giving full information on the STANDARD Model TM, Portable Asphalt Plant

10-PR

STANDARD STEEL CORPORATION

5003 Boyle Ave., Los Angeles 58 • 15 Park Row, New York 3

Fleet of SWENSON-Equipped Trucks Speed Blacktop Jobs

Contractors save money with Swenson Spreaders. Write for information.

Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

Mc
McCARTER

FACTORY TO YOU

No middleman involved when you buy a McCarter Asphalt Plant.

This factory-to-you plan guarantees you the most for your money in equipment . . . the most satisfactory service.

Designed by our own engineers, built in our own factory, serviced directly by our factory experts.

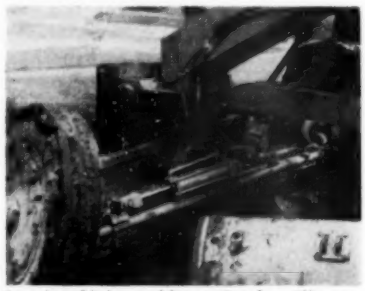
Our sales engineers will be glad to counsel with you.

REPAIRS AND MODERNIZING

We specialize in remodeling old plants for better production and more efficient operation.

Mc
McCARTER **IRON WORKS, INC.** NORRISTOWN, PA.

a spring on the valve puts only enough tension on the steering wheel to provide the "feel" of steering. Road shock is stated to be completely eliminated. Popular with grader operators who have already tested the Rivinius steering unit is the locking feature. Particularly on ditching work it is of advantage to the operator to remove both hands from the wheel in order to handle control levers. The Rivinius unit automatically locks the front wheels in whatever position they are, holding the grader "on course", even over rough ground.

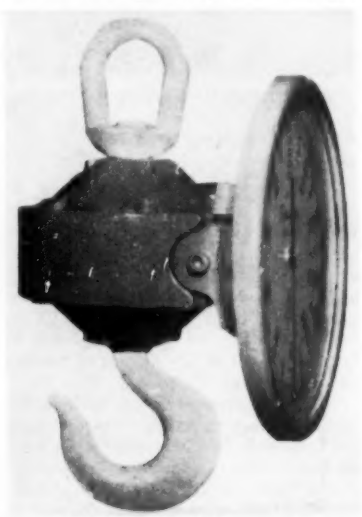


Steering Unit on Motor Grader. Illustration Shows Cylinder Which Provides Locking Feature

New Hook Scale Is Both Strong and Accurate

The Martin-Decker SU-20 "Sensater" is a hydraulically operated hook scale that has a guaranteed accuracy of ½ of 1% of capacity at any point on the dial. This accuracy, it is stated, was made possible through the discovery and development of a new kind of mobile diaphragm that develops a piston-like stroke — but without a friction-causing piston rod or packing. The diaphragm does not deflect, but moves with its backing plate, transmitting a constantly accurate signal to the gauge. The scale is available in capacities of 2,500; 5,000; 10,000; and 20,000 lb.

Other features noted by the manufacturer are: Accuracy unaffected by temperature and fluid changes; low headroom loss and light weight — the 10,000

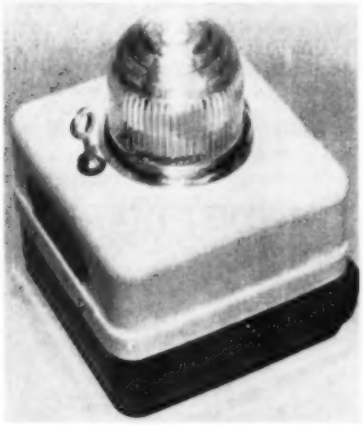


Martin-Decker's "Sensater"

lb. capacity scale requires only 17¾ in. and weighs but 73 lb. Gauge can be tilted up or down to any eye level. Twelve-inch, dual-range dial has bold lines for distant reading and fine lines for close, accurate reading. Scale has a 25% tare adjustment. Write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif.

Flashing Light for Traffic Warning

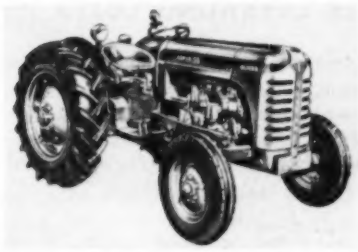
The new Electro-Flasher placed on the market by Electro-Flasher Co., P.O. Box 4751, San Francisco 1, Calif., provides a highly visible flashing light for traffic warning purposes. Basically as simple as a flashlight, it works on batteries and is easily portable to any spot where road or street construction, vehicle repairs, or other projects may obstruct traffic. The entire unit is designed to withstand tough outdoor use, and is stated to require no maintenance repairs. Flasher contacts are sealed in vacuum. The square case is of steel, painted in bright colors. The prismatic lens, molded of transparent Tenite butyrate plastic, is shatterproof and exceptionally rust- and weather-resistant.



Electro-Flasher

Oliver Announces New Wheel Tractor

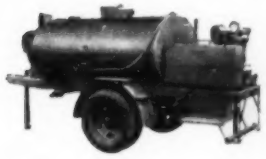
A brand-new, all-purpose wheel tractor has been announced by The Oliver Corp., Chicago. The new unit, known as the "Super 55," is designed for both industrial and farm service. It is a 4-wheel, adjustable tread type with low profile and short wheel base, and is available with either diesel or gasoline power. Hood height is 4½ ft. and wheel



The Oliver "Super 55"

with a **ROSCO**

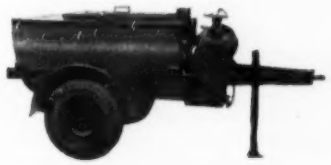
That's a photo of Francis Willette of the Willette Excavating Co. blacktopping the 8300 sq. yd. parking lot of the Dunwoody Institute in Minneapolis. His Rosco MODEL RHU MAINTENANCE DISTRIBUTOR is making money on every job. Quick to start and get going, the RHU is designed for economical bituminous maintenance and limited construction. It has many of the features required by contractors . . . as well as municipalities. For driveways, alleys, streets, parking lots, shoulders, re-shaping curves, patching, sealing and a host of other jobs . . . Model RHU will get YOU "into the profit picture". Check the money-making features with your Rosco dealer. He'll show you what Model RHU can do for you. 800 to 1000 gallon capacity.



2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.

ROSCO ASPHALT KETTLES

Used by contractors, highway departments, roofers and waterproofers for heating and melting all types of bituminous materials. Two-pass heating system, ruggedly built. Capacity 2, 3 or 4 barrels.



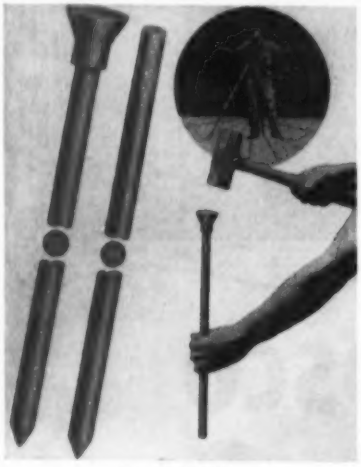
ROSCO MINNEAPOLIS
ROSCO MANUFACTURING CO.
3118 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

base is 73 in. Tractor without attachments weights about 3,000 lb.

As standard equipment, the "Super 55" includes a 6-forward-speed transmission with a super-low gear capable of speeds from ¾ to 1½ miles per hour, and a built-in hydraulic system with finger-tip control for the 3-point hitch. It is designed to accommodate front- or side-mounted attachments.

Permanent Markers for Boundary Line Surveys

A new survey marker, claimed to locate survey points permanently, has been introduced by the Copperweld Steel Co., Wire and Cable Division, Glassport, Pa. Each marker (standard length 3 ft.) consists of a strong steel core to which a thick copper covering is inseparably molten-welded. This provides strength for easy driving without splintering, bending or breaking and, at the same time, assures long life. In the event these survey markers are buried a few inches under the surface, they can be located easily by using a dip needle.



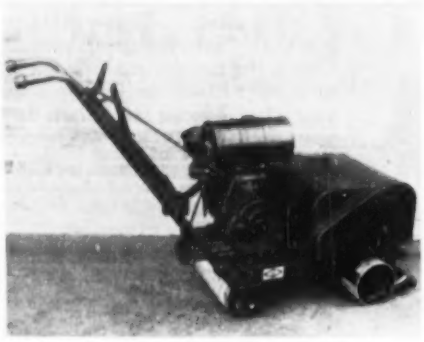
Survey Markers

Sierra Movall End Dump Wagon

Combination Rock and Dirt Wagon

A new cable operated end dump rock and dirt wagon, the Sierra Movall, is now in production by C&D Manufacturing Co., Perkins, Calif. Interchangeable goosenecks make wagon quickly adaptable for use with Caterpillar DW20 or DW21 tractor. Capacity is 19 cu. yd. struck; 25 cu. yd. heaped. Maximum carrying capacity, 31 tons. Principal features include an 11 ft. x 19 ft. target area for easier shovel loading; positive cable-controlled ejection; controlled spreading for superior performance in dirt. Ability to dump from jackknifed position, and independently controlled air brakes which permit locking either tractor or wagon wheels, or both, add to dumping speed and safety. Constructed of high tensile steel, welded in precision jigs, the new wagon is claimed to offer maximum strength and ruggedness, minimum dead weight.

LUCAS
ASPHALT COMPACTOR



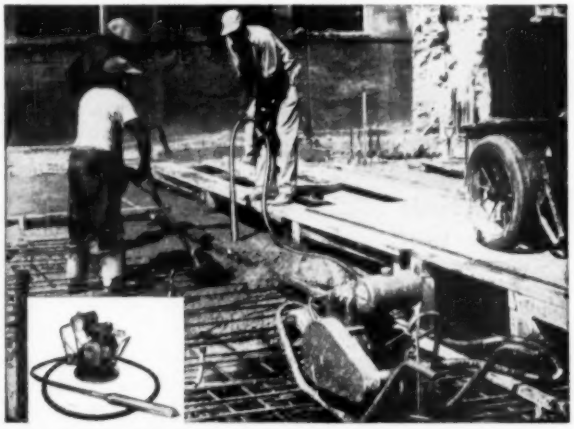
Eliminates Hand Tamping

This portable, precision-built compactor is used for tamping and rolling asphalt close to walls, light poles, traffic signals and in all inaccessible places . . . and for use on all types of asphalt patching and repairing jobs.

WE WANT DEALERS

Contractors, See Your Nearest Dealer, Or Write

LUCAS ASPHALT COMPACTOR COMPANY
2209 E. Market St. Stockton, Calif.



WHITE VIBRATORS OFFER LOWER OPERATING COSTS

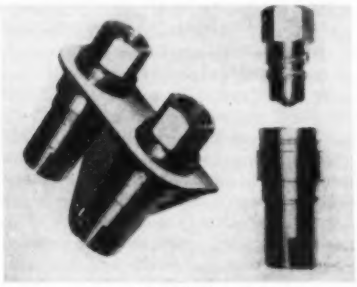
INITIAL PRICE IS LOWER • ALL DRIVE SECTIONS ARE INTERCHANGEABLE • ALL VIBRATOR HEADS ARE INTERCHANGEABLE • LENGTH OF DRIVE IS UNLIMITED • ENGINE OR MOTOR POWER UNITS ARE OF STANDARD MANUFACTURE • MINIMUM OF SPARE PARTS REQUIRED • BACKED BY 20 YEARS OF SUCCESSFUL USE

For FREE circular, write—

Elkhart 20 White Mfg. Co. Indiana

New Design in Quick Couplers

A new positive quick connect and break-away coupler for hydraulic and air lines is now being manufactured by the Standard Valve and Coupler Co., 1114 Ulysses Ave., NE, Minneapolis, Minn. This coupler, known as the



The "Jiffy" Coupler

"Jiffy," is designed for hydraulic operated equipment whether towed or mounted, and for semi-trailer trucks, air compressor lines, and many industrial plant uses.

Made from all-plated rust-proofed steel with tempered valve seats and ball check valve construction the "Jiffy" coupler insures a positive seal and can be either coupled or uncoupled under pressure without the use of any tools nor the loss of either pressure or fluid, since it seals both lines instantly when uncoupled.

New Model Davey Clay Digger

A new, heavy duty clay digger is announced by Davey Compressor Co., Kent, Ohio. Designated as Model DD-30, it is designed for excavating stiff clay and hard pan as well as concrete and shale. Its latch-type chuck retainer permits a quick change of working steels such as spades, picks, or tampers.

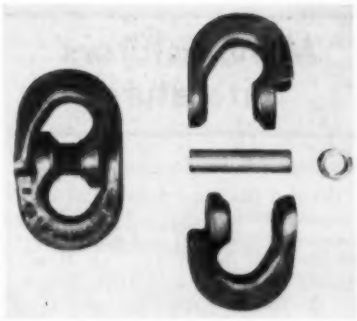
Cross-Section View of Davey DD-30 Heavy Duty Clay Digger

Important features include a new type wafer plate valve with differential porting. This assures positive piston hammer action. Also, the tool's chrome-plated cylinder bore is said to more than double effective working life. The manufacturer emphasizes that many of the parts used in the DD-30 are the same as used in other Davey tools.

Another feature is a built-in lubricator which gives pressure lubrication to all moving parts.

Repair Links for Drag Chains

A new product designed to enable dragline operators to repair drag chains with greater speed and ease has been announced by Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore. The new design consists of a change in the method of locking the link connecting pin in place and is labeled "Spring-Lock" repair link. It is a tightly compressed coil spring that grips the pin, replacing the elliptical collar formerly used. Dimensional tolerances of this spring are such that upon driving the hinge pin into the spring, the spring is expanded radially, well within the elastic limit of the spring material. When in service the spring material acts as a continual grip on the pin and in continued use has a tendency to grip harder rather than to loosen. Due to its ease of installation, strength, and abrasion-resistant qualities, it is stated to have proven economical in operation. No special tools are needed, as links can be installed in a matter of minutes with an ordinary hammer.



"Spring-Lock" Repair Unit

. . . over better roads

built with Cummer Asphalt Plants

Since 1895 Leading Contractors Have Depended on Cummer Plants for Profitable Highway Construction and Improvement

Cummer Asphalt Plants are designed and built to make money for their owners — through fast, efficient, dependable production.

Cummer Engineering, the result of almost sixty years' experience devoted exclusively to asphalt plants, insures profitable efficiency.

And the rugged construction of Cummer Asphalt Plants means greater dependability, less down-time, a minimum of repair and maintenance costs. When replacement parts are needed, Cummer service is exceptionally prompt and helpful.

Typical of today's Cummer Asphalt Plants is the stationary plant pictured at the top, right, purchased by Standard Asphalt and Paving Co., Cleveland, Ohio. This complete plant, with a capacity of 100 tons per hour, includes dust collecting system which discharges reclaimed dust into hot elevator and the latest in Cummer developments for reducing operating costs and upkeep time —the new Roller Path and Horizontal Tangential Chain and Sprocket Drive on the large-capacity dryer.

An entirely new illustrated Cummer Catalog has just been issued. Shows types of asphalt plants, gives complete specifications, information on component parts and additional equipment and accessories. Write for your copy today.

CUMMER

THE F. D. CUMMER & SON CO.

1827 EAST 18TH STREET

CLEVELAND 14, OHIO

Manufacturers' Literature

Magnetic Sweepers

Detailed illustrated information on its complete line of magnetic hand and road sweepers is contained in 4-page Bulletin MS-250, just issued by The Homer Manufacturing Co., Inc., Dept. 280, Lima, O. These sweepers are used to remove tramp iron and other magnetic materials from roads, streets, airports, construction jobs, machine shop and factory aisles, loading areas, etc., wherever tramp iron presents a hazard to rubber tired vehicles or plant personnel.

Maintenance Tips for Unpaved Roads

The handy size, 36-page maintenance booklet "Maintenance Tips For Unpaved Roads," published by the Calcium Chloride Institute, 909 Ring Building, Washington 6, D.C., has been revised and copies are available on request. The booklet was written to help patrolmen, maintenance supervisors, and engineers obtain best results from the use of calcium chloride on unpaved roads. Separate sections of the booklet deal with normal maintenance operations and specific questions and tables are included. The information presented is designed to produce specific maintenance procedures for unpaved roads, and it is the result of many years of field experience and laboratory research.

Resurface with the H&B Moto-Paver

Moto-Paver speeds the resurfacing job—and cuts the cost. Savings up to 50% over other methods have been reported. Moto-Paver performance records—under all kinds of conditions—prove conclusively that *no other method or machine produces comparable results at comparable cost.*

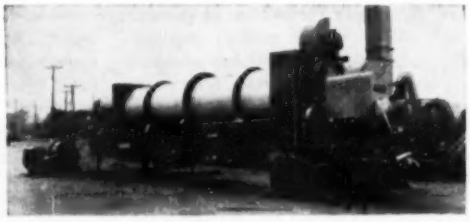
Moto-Paver uses beach sand, gravel, crushed stone or slag aggregates and various bituminous materials including tars, cutback asphalts, road oils and emulsions. Road speeds up to 25 mph make possible quick moves from one job to another.

Standard and heavy duty models for all types of resurfacing jobs and all kinds of operating conditions.

See your local H & B dealer, or write for Bulletin MP-49.

PORTABLE DRYER
For Use with Moto-Paver

This portable dryer is especially adapted for use with the Moto-Paver, to give protection against weather hazards, also to permit use of heavier asphalts and oils. It is equipped with a gas engine and low-pressure oil burners—and requires no boiler. Hinge jack legs eliminate the necessity for foundations or cribbing. Semi-trailer arrangement provides maximum portability.



HETHERINGTON & BERNER INC.
721 KENTUCKY AVE., INDIANAPOLIS 7, IND.

Bay City Catalog on Light-Weight 1½ yard Crane-Shovel

A 16-page catalog has just been released by Bay City Shovels, Inc., Bay City, Mich., describing the many design and construction features of their recently announced 1½-yd. crane-shovel. A notable feature is the profuse illustration: over-all views, parts, and details. Of particular interest is the adaption of self-energizing, shoe-type clutches for swing and hoist. There are two shoes with fixed anchor to each clutch. Each shoe has single adjustment and ¾ in. moulded lining for long life. The main drum clutches are set by a power booster shoe through mechanical linkage.

Another modern advance is an hydraulic coupling, mounted between a two-plate disconnect clutch and the helical gear power take-off, to cushion shock loads and prevent stalling of engine under adverse operating conditions. Copy of Catalog 70.700-A is available upon request.

Galion's Model 104 Motor Grader

A new 28-page catalog is available on the Galion Model 104, 93-h.p. motor grader. All important features of design and construction are illustrated and described and complete specifications are listed. The advantages and construction of features, such as the "fool-proof" hydraulic control system, constant-mesh transmission, and four-wheel all-gear tandem drive, are interestingly presented with detailed cross-section views.

Many action photos show the Model 104 in all types of maintenance and construction work. Also shown and described are the various attachments.

A free copy of Catalog No. 353 is available from any Galion distributor or direct from the Galion Iron Works & Mfg. Co., Galion, Ohio.

Catalog Condensations in 7 Languages

Publication of catalog condensations in seven different languages has been completed by the Hyster Co. Copies are now available in either French, German, Italian, Norwegian, Portuguese, Spanish or Swedish. Descriptions and specifications of Hyster lift trucks, straddle trucks and karry kranes, ranging in lifting capacity from 2,000 to 30,000 lb., are given in one catalog, while another outlines Hyster winches, excavator cranes and additional attachments for mounting on Caterpillar-built tractors. Either may be obtained in the above languages by writing Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.

12 Cu. Ft. Shoveloader

A condensed picture catalog on their new Model 20 Shoveloader, a rubber-tire tractor loader with a standard bucket capacity of 12 cu. ft., has been published by Baker-Lull Corporation, 314 West 90th St., Minneapolis 20, Minn. The Model 20 have an "all-in-one" packaged power train that is claimed to help

reduce original purchase price and simplify maintenance. Extra accessories such as lift forks, special narrow bucket, solid tires, crane hook and catalytic equipment are available. The catalog contains specifications, data and action diagrams.

Torches and Tips for Cutting and Welding

A new 36-page catalog (ADC 702B) covering its complete line of torches and tips for oxyacetylene cutting and welding has been issued by Air Reduction Sales Co., 60 East 42nd St., New York 17, N.Y. Every Airco standard torch and tip is listed along with the necessary mixers, extensions, adapters and accessories that are used with the torches. Complete information is presented through carefully planned illustrations, charts and descriptions.

Filtering Lubricating Oil

The necessity of efficient, dependable filtering of lubricating oil is pointed out in "No Short Cuts to Safe Filtering," a new booklet (Form 31085) published by Caterpillar Tractor Co., Peoria, Ill. This 8-page booklet discusses the risks in "short cuts" in lubricating oil filter systems and the importance of using a filter made for your engine. A step by step discussion of what a filter must accomplish and a description of how a full-flow filtering system serves the engine are also included in this publication.

Tractor-Trailer Power Take-Off Drive

The new power take-off drive developed by Stow Manufacturing Co., 906 Shear St., Binghamton, N. Y., is described in a new bulletin No. 542. This drive consisting of a 1¾ in. flexible shaft in combination with a square telescopic rod and tube is claimed to do away with delicate and expensive power couplers. It is being used on dump trailers as well as to pump petroleum, natural gas, and other liquids. Bulletin No. 542 gives complete measuring and ordering instructions.

Diesel Engines, Power Units, Electric Plants

A comprehensive catalog on its diesel engine products has been issued by Dallett Manufacturing Co., 1601 West Florence Ave., Inglewood, Calif. Covered in the catalog are two models of air cooled diesel engines, diesel engine water cooled power units, two models of marine diesel engines, diesel electric plants, and diesel pumping units. Specifications and features of the products are included and performance curves are given.

Lima Type 703-SC Lifting Crane

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, O., has announced the availability of descriptive bulletins (73SC-B), covering its recently introduced Lima type 703-SC lifting crane, available on crawler, truck or wheel mount. On crawlers, the new unit has a lifting capacity of 50 tons at 12 ft. radius with a 50-ft. boom and a capacity of 2,875 lb. at 110-ft. radius with a 130-ft. boom. Crawlers are 18 ft., 6 in. in length and 14 ft., 2 in. in width. Working weight is approximately 117,900 lb.

Electric Equipment for Heavy Construction Tools

A new bulletin, Electric Equipment for Heavy Construction Tools, is available from the General Electric Co., Schenectady 5, N. Y. Designated GEA-6195, the 8-page publication contains case histories of various electrified construction equipment applications for dam construction. According to G. E., the principles of construction tool electrification reported can be applied by all contractors.

New Transmission Belt

Poly-V drive, Raybestos-Manhattan's new concept of belt power transmission is described in brochure #6638 just issued by the Manhattan Rubber Division, Passaic, N. J., developers of the new belt and V-grooved sheave. Design characteristics of the single, endless belt with molded lengthwise ribs, are explained in two-color line-drawings that show why fourteen specific advantages are claimed for the drive.

(Continued on page 130)

WHAT ABOUT YOU, MR. READER?

Are you still active in the field? Have you moved or changed your position?

Unless you send this information directly to us we can't be sure. Sometimes a reader's name is cut from the mailing list because we are not sure that our information as to name, title and address is right. *Your* name might be cut from the mailing list.

Don't Let This Happen to You

Even if you think we know all about you, please fill in the information requested below and send to us by return mail. Our auditors require proof of accuracy of our mailing list. *You* are the only person who can help us on this. Do it now before you forget, so you can be sure your magazine will always be properly addressed to you. New names cannot be added or old names retained on our list unless we have *all* this information. *Please print or type.*

ROADS AND STREETS DATE_____
22 WEST MAPLE STREET, CHICAGO 10, ILL.

☐ I do receive ROADS & STREETS and wish to continue to receive it.
☐ I do not receive ROADS & STREETS but would like to have it.

NAME

TITLE OR OCCUPATION

FIRM NAME OR GOVERNMENT DEPARTMENT (give street address)

CITY ZONE (if any) STATE
(If you have moved give *old and new* address)

SIGNATURE

ROAD BUILDING PROGRAM AT ALL-TIME HIGH

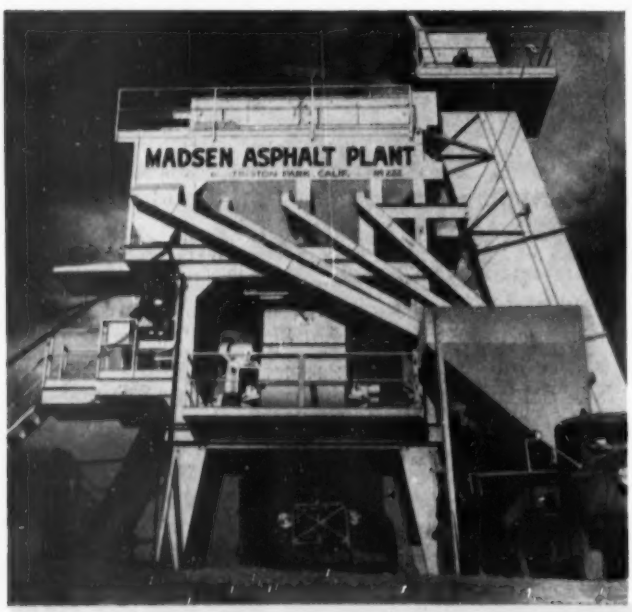
NOW!

MORE THAN EVER YOU NEED THE

High Production, Flexibility and Dependability of

MADSEN

ASPHALT PLANTS



THE MADSEN MODEL 481 BATCH CAPACITY ASPHALT PLANT

. . . engineered and built to provide a portable asphalt paving plant having a faster charge-mix-discharge cycle, greater accessibility, easier maintenance and more desirable features than can be found in any other asphalt plant of its type

Business is good and the future looks bright for the builders of America's highways. MADSEN Asphalt Plants are playing their part in the nation's big road-building program. In California alone, for example, there have been more MADSEN Asphalt Plants sold in the past two years than all other makes combined.

Production records of MADSEN Asphalt Plants, we believe, are the highest of any batch type plants built . . . and the highest possible production is necessary for maximum profits. The outstanding MADSEN Model 481 Asphalt Plant may be purchased as a 4000-lb. plant and later converted into a 5000-lb. or 6000-lb. plant with very little modification . . . that's flexibility that gives you real economy. As for dependability, consider this fact . . . MADSEN has been building asphalt paving plants since 1914 (the oldest manufacturer of asphalt plants in the West). The experience and knowledge gained throughout these years enable MADSEN to assure you of maximum dependability in every MADSEN product. Yes, MADSEN gives you the things you want, the things you need in an asphalt plant to make money on today's and tomorrow's jobs.

MADSEN OFFERS YOU A COMPLETE LINE OF ASPHALT PAVING PLANTS IN SIZES FROM 1000-LBS. PER BATCH TO 6000-LBS. PER BATCH . . . AS WELL AS A COMPLETE LINE OF ASPHALT PAVING PLANT EQUIPMENT. Write for the complete MADSEN Catalog today.

Equipment that Serves ®

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D-4 w/1 c.y. hydraulic loader.
D-8 tractor and bulldozer.
No. 12 Cat motor patrol.
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500 c.f. Cat diesel compressor.
¾ yd. 1953 truck crane, 3 drums, ideal for piling.
28x55' steel barge w/18 ton crane w/65' boom.
M-115 piling, random lengths.
4'x8' concrete panel forms, lined.
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All types of paving and
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150 ton NOBLE Automatic Concrete Batching Plant.
TD-9 International Crawler type Loader with ¾-yd. bucket.
Double drum hoist cable and Sauerman buckets.
2 Concrete mixers and trucks.

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Cat. #12 Grader #8T 3027.
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Link-Belt 75, comb. Crane, dragline shovel.
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1—TD-9 with dozer & winch.
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Wagon drills, jack hammers, air hoists, tampers, paving breakers, riveting tools, woodborers, impact wrenches, concrete vibrators.

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Manitowoc 2000 & 3000
Link Belt LS50, 85, & K360
Northwest 25, 41, & 6 & 80D
Bucyrus-Erie 15B, 22B, & 54B
Koehring 501 & 605
Marion 362

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1—Bailer, shopmade, 24" size for 30" drilling.
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2—Drill Stem, with combination wire rope socket 6½"x20' (approx.).
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28—Bits, 9", 500 lbs. (sharpened).
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Protected Territories — Liberal Commissions
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35 ft. boom for Lima 34 Paymaster. Like new $650.00

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Bob Campbell
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Telephone: SHerman 4-2711
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1—30"x50' Lippman portable belt conveyor with Wisconsin VF4 air cooled gasoline power unit and drive, with towing yoke, pneumatic tires and swivel axles, with 5 foot long swivel spout. One — 10'x10' feed hopper with control gate for feeding conveyor. Conveyor ordered for customer but refused because of late delivery. Original price $6,295.00. Sale price $4,795.00.

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2—300 CFM Ingersoll Rand Portable Air Compressors on wheels, good running condition ..... $450.00 Each

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1—5 Ton Cap. Kerry Crane, pneumatic tires $2,250.00

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STANDARD STEEL Asphalt Paving Plant, Series SEM 400 lb. Semi-Portable (100-125 Ton per hour) Using combination Diesel Engine, Electric Gearmotor and Motor Drives. Including cold elevator with 16″ x 8″ buckets; 72″ x 30′ sand dryer with burner and drive excluding power unit; base structure; mix and weigh section; stairway, platform and ladder; 40 ton storage bin with gates, overflow pipes, reject chute; 48″ x 12′ horizontal vibrating screen with 4-way separation and drive; steam jacketed mixer with drive excluding power unit; mixer dust housing; weigh hopper scale system; steam jacketed asphalt bucket with scale system; hot elevator with 16″ x 8″ buckets and 20 hp gearmotor, 4-ton auxiliary overflow bin; dust collecting system including 10′ diameter cyclone, piping, fan; dust elevator with gearmotor; dust bin and screw with motor; timer with mixer, weigh box interlock and batch counter; fuel oil pump set; recording pyrometer; UD-24 diesel engine for mixer drive, including one 40KW generator and 2 UD-14 diesel engines for dryer and fan drive.
Condition: Completely new. Never erected or operated.

Price: Reasonable.

BOX 1144, ROADS & STREETS

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Guaranteed Rebuilt

1951 Model D8 Caterpillar Tractor No. 2U14094 with Caterpillar Double Drum Power Control Unit & Angledozer. Like New. Price Reasonable.

Will trade for other equipment.

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With Immediate Possession

Steamer James P. Pearson, towboat and sand sucker, coal fired, 200 H.P., sternwheel, wood hull 96′ x 23′5″ x 4′, kept in excellent repair. Coast Guard 1954-55 inspected. Price $7,500.

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Brownhoist — Locomotive crane, Ser. #9547, 25 ton, 50′ boom, never used since overhaul, excellent mechanical, may need some boiler repair. Price $3,000.00.

Portable conveyor 30′ x 18″, powered by Wisconsin air cooled Type AHH, good condition. Price $750.00.

Pioneer Jaw Crusher 9′ x 36″ PB, mounted on 4 steel wheels, fair cond. Price $1,000.00.

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35 TONS EACH

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150 KW — 120 Volt — 1250 Amp

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2 — Ingersoll-Rand Wagon Drills

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All boilers are equipped with oil burners

Subject to prior sale

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For Sale

MODEL 2000-B CLAMSHELL

Manitowoc, Crane Ser. #22182, 45 ft. Boom. Caterpiller D-13000 Diesel Engine. Independent boom hoist. 14 ft. 7 in. crawler with 30 in. treads. Extended boom rigging. Open throat, boom point.
Fuel Transfer Pump. 1 15-ft. Center Boom Section. Winch head on drum shaft Hot w. Engine Heater. Lift crane conversion. 1-Kiesler 1½ yd. Type 4 Clamshell Bucket.
All in excellent condition.

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1—Almost New Lorain L-80 1¾ yard Shovel Front. Complete with lagging and trip mechanism.

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1—Northwest No. 25 with shovel front and Cat D318 engine. Only 2 years old, used 2600 hours. A Good clean machine — $13,500.00.

1—Cat #12 Motor Grader No. 8T4784, with large front tires and scarifier. Grader in good shape, tires excellent — $6,000.00.

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BARGAIN—$5,000

1—Used Buffalo-Springfield 3 Axle Tandem Roller — Model KX-16, 9 to 14 Ton. Machine in good working condition — Priced to sell. Immediate Delivery. Located in Rapid City, South Dakota.

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Subject to Prior Sale

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FOR SALE

1—H3 BUCYRUS-ERIE Hydrocrane. Purchased Jan. '52 . . $ 7,500

1—22B Backhoe (BUCYRUS-ERIE). Purchased Jan. '54 . . . 18,000

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For Immediate Use on Large Project

Fairleads for Lima 1201 & Northwest 6 50' or longer Crane Boom for Northwest 6 Blaw Knox 20—25 foot spreader & finisher 8", 9", 10", 12", 15", & 17" airport & Road forms.
Late Model Koehring Model 34E paver.
4000 lb. Asphalt Plant.
Barber Greene 879A finisher.
Backhoe Attachment for NW 25 & 6 7 B.E.
22B 20 Ton Truck Crane.
4-10 yard dragline or shovel combination.
Caterpillar No. 12 Motor Grader, late model Tandem and 3 wheel rollers.

We also need any and all types of construction, paving, grading, or other equipment at once. List your surplus equipment with us and we will turn it into cash for you!

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This equipment priced right and in good shape to be sold as is, where is

1 P & H Crane, Model 6558, w/counterweights, 70' boom, 25' jib, boom stops, high gantry. Fair leads and tagline. Available now.

1 D-6 Cat. #8030 w/hyster. Model 24, cable control unit, ser. 51356, angle dozer, ser. A182 259-SK.G.A. Completely overhauled. Available now.

1 TD-6 International Crawler Tractor 30" wide tread w/Bucyrus Erie 6WG-2 yd. bull grader w/front pump, serial no. 29853 w/1 set rubber pads for tracks. Available December 15, 1954 (approximately).

1 TD-9 International Diesel Crawler Tractor w/ Bucyrus Erie, model 9DSNS dozer shovel w/1 cu. yd. 75" wide bucket w/teeth. Available December 15, 1954 (approximately).

1 Koehring Model 605 Diesel Crawler Crane, serial C-5725 w/80' boom, 10' jib tagline and accessories. Available December 15, 1954 (approximately).

1 Compressor Worthington 500 CFM, serial no. 104473. Available December 15, 1954 (approximately).

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Telephone 56311, Ext. 8510

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Caterpillar 12 Grader, w/Scarifier, cab, new tires, 7T series, good condition	$ 4,000
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Caterpillar 80 Scraper, large tires	6,500
Caterpillar 70 Scraper, large tires	5,500
LeTourneau L.S. Scraper, 8-11 yds.	2,500
LaPlant Choate C86 Scraper, 15-19 yds.	1,650
Hyster D8N Worm Drive winch, complete	1,500
Hyster D6N Worm Drive winch, complete	1,350
International TD18 Tractor w/DDPC	1,250
Sullivan 365 cu. ft. Diesel Comp.	3,000
Lorain MC 254 Moto Crane	11,750
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4— 1TD 22 TON EUCLIDS	EACH	5,000.00
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2—38 FTD 13 YD. EUCLIDS	EACH	$7,000.00
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1—DW10 CATERPILLAR (Hydraulic Controls)		$ 4,250.00
2—C-11 LE TOURNEAUS	EACH	5,000.00
1—12 YD. LA PLANTE CHOATE (Crawler Drawn)		2,750.00
4—W LE TOURNEAUS	EACH	5,000.00
TRACTORS		
7—HD-19 ALLIS CHALMERS		8,000.00

Subject to Prior Sale

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Equipment traded on New Tournapulls

TRACTORS

2—TD-18A IHC with Angledozers.
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3—D8 Caterpillars with Sidebooms.

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1—Adams Model 512 (Completely rebuilt)

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BUDA DIESEL ENGINE: Model 6-DCS-1879, 230 horsepower, 1200 RPM, industrial, supercharged, complete from fan to flywheel. Used and in good running condition.

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AUTOCAR TRACTOR WITH CUMMINS DIESEL ENGINE: Tractor is Autocar Model C70TS, year 1947, with 5-speed main and 3-speed auxilary transmission and 1100x 22 tires, newly painted and in good condition. Powered by Cummins Diesel Engine Model HRB-600, 165 horsepower, 1800 RPM, in excellent condition with only about 5,000 miles of operation.

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25% DISCOUNT

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1 — Practically new 99 Master Austin-Western Motor Grader with IHC-UD16 Diesel 100 H.P. Engine, 13' Mold Board.

Sacrificed at — $11,000.00

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Phone: Mohawk 46970
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FOR SALE

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KOEHRING PAVER, Twinbatch, 16E 28' Boom, rubber tires 11:00x20; 24 cu. ft. Discharge Bucket, 2-71 GM Diesel Engine. Machine Serial #23991; Engine Serial #2A3742, Model #2055.

HELTZEL CONCRETE FINISHING MACHINE, two-screed, 10'-15' adjustable width, Tamping Device, Pneumatic transport wheels; Powered with 4 cyl, Wisconsin air cooled gas engine. Machine Serial #M100.

GRIFFIN WELL POINT PUMP, 8", Model 88D, 1700 GPM, Vacuum Pump on 4 steel wheels; Powered by UD6 IHC; Diesel Engine; Pump Serial #4604.

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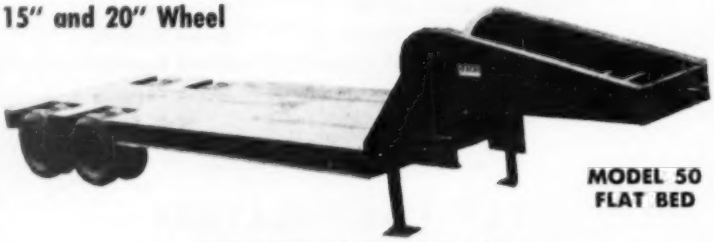

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LIKE NEW and slightly used parts for "Cat" equipment. Most show only slight wear; all have many hours of useful service.

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LARGE STOCK —

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See Page 119 for Clearing House Rates

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42"x16' Heavy duty Diamond Apron Feeder.

13B Telesmith Gyratory Breaker.

10B Telesmith Gyratory Breaker.

All equipment in good condition and immediately available.

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Manufacturers' Literature

(Continued from page 117)

Plaster and Mortar Mixers

A 4-page 2-color catalog on Knickerbocker mixers for plaster, mortar, stucco and structolite has been issued. It describes and illustrates the Knickerbocker No. 9 "Master-Mixer" for two-bag batches, and the No. 4 "Mix-Miser" with new full one bag capacity. Write S. L. Walker, Sales Manager, for copies. 640 Liberty St., Jackson, Mich.

Concrete Troweler

Its new concrete troweler with retractable wheel is described in detail in a new circular No. 45, announced by White Manufacturing Co., Elkhart, Ind. Features of the troweler are illustrated and described and specifications are given. With the retractable wheel lowered, the White troweler offers one-man portability. Wheel it down a plank from your truck and directly to job, or assemble it by your car and then wheel it over to the slab. The wheel and stand retract and the machine is then ready to operate. When the job is finished, the machine can be wheeled off the slab by one man to another job or to the truck.

Truck Crane

A 16-page bulletin (TX-152) covering the P & H Model 55 truck crane, known as Miti-Mite has been published by Harnischfeger Corporation, 4604 West National Ave., Milwaukee 16, Wis. Designs and features of this machine are reported, by concise descriptions and large pictures. Special attention is given to the full convertibility of this machine for all services — dragline, crane, magnet crane, shovel, trench hoe, clamshell. Emphasizing its simple mounting on any suitable truck, a spread is devoted to Miti-Mite showing it in service on various types of carriers.

Rear Dump Hauler

A new 6-page folder (Form No. PR-1014) on its new PR 21 rear dump hauler, available from Athey Products Corporation, 5631 West 65th St., Chicago 38, Ill., shows in words and photos, how the PR 21 works, how it's built and how it can make money on material moving contracts. Specifications on the 225 cu. yd. PR 21 and on its 275 hp (ASME test codes) Cat DW21 teammate are given.

Long Crawler Excavator

A new bulletin on the Model 255 ALC ¾-yd. long-crawler P & H excavator is available. Printed in two colors, the 4-page bulletin carries descriptions and illustrations of the complete machine, as well as detailed information on the extra-long, wide crawlers. For a copy of this bulletin, No. X-161, write Harnischfeger Corporation, Small Excavator Division, 4609 West National Ave., Milwaukee 46, Wis.

With the Manufacturers and Distributors

ARMCO EXPANDS STEEL BUILDING DEPARTMENT. Armco Drainage & Metal Products, Inc., a subsidiary of Armco Steel Corp., Middletown, Ohio, has announced a major expansion of its activities in the field of pre-fabricated steel buildings. S. R. Ives, president, states that the expansion will involve a revamping of the company's development programs, sales plans, and production facilities for steel buildings and building products. "Steelox" and "Pioneer" are the names under which the company's business in this field has been built.

GALION TRANSFERS EVANS. Charles O. Evans has been transferred from the Pacific northwest territory of The Galion Iron Works & Mfg. Co., and is now the Galion district representative in the states of Florida, Georgia, North and South Carolina. He replaces J. D. Talbott who has resigned.

LETOURNEAU-WESTINGHOUSE SALES DEPARTMENT CHANGE. William H. Schwagmeyer, former sales engineer in the Wire Rope Sales Division of LeTourneau-Westinghouse Co., Peoria, Ill., has been named district sales representative in the territory embracing the states of Kentucky, Tennessee, Virginia and North Carolina. William C. Knight, district sales representative, has been transferred from a territory in the southeast United States to serve in the lower peninsula of Michigan, all of the provinces of Ontario, Can., east of 86° longitude west.

BARNES APPOINTS NEW ADVERTISING MANAGER. Clark Munger, formerly housewares advertising supervisor for Westinghouse, has been appointed advertising and sales promotion manager for Barnes Manufacturing Co., Mansfield, O.

NEW WARCO DISTRIBUTOR. Credle Equipment, Inc., Utica, N.Y., has been appointed distributor for Warco motor graders of W. A. Riddle Corp., Bucyrus, O.

NEW BUCYRUS-ERIE DISTRIBUTOR. West Coast Engine & Equipment Co., 1077 Eastshore Highway, Berkeley, Calif., has been appointed distributor in Northern California for Bucyrus-Erie Co., South Milwaukee, Wis.

DIAMOND TOOL ASSOCIATES FORMED. The formation of Diamond Tool Associates, a new concern which will manufacture and distribute a complete line of diamond abrasive cut-off blades, has been announced by John F. Martyr, sales manager and partner. The company is located in Hawthorne, Calif. A full line of diamond core drills will also be manufactured.

Think what

Flintseal* **saves you**

per mile of joints

For mile after mile of trouble-free and economical concrete pavement joints, specify FLINTSEAL.

A rubber-asphalt hot-poured compound, Flintseal *holds* its bond and *seals* out water *positively* through all weather. Won't crack or fail in cold. Won't flow or smear in heat. Stays extensible and compressible through expansion and contraction of the pavement slabs. Remember, for every mile of pavement you have approximately two miles of joints.

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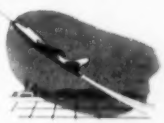

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NEW GALION DISTRICT REPRESENTATIVE. Robert N. Shears has been appointed district representative in the Pacific Northwest by Galion Iron Works & Mfg. Co., Galion, O. His headquarters will be in Portland, Ore. He replaces Charles O. Evans who has been transferred to the southeast coast territory as a district representative.

NEW DISTRIBUTOR FOR HIGHWAY EQUIPMENT CO. The Long-Talbot Equipment Co., Columbia, S.C., has been appointed dealer for complete line of Hi-Way spreaders of Highway Equipment Co., Inc., Cedar Rapids, Ia., for the state of South Carolina.

NEW DISTRIBUTOR FOR GALION ALLSTEEL. Power Brake & Equipment Co., 230 South Water St., Tampa, Fla., has been appointed distributor of dump bodies and hoists in central and western Florida by The Galion Allsteel Body Co., Galion, O.

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Stay as long as you like

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DIRECTLY ON THE OCEAN AT 42nd ST.

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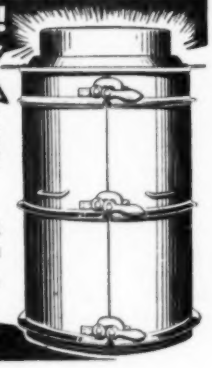
THE Quinn Standard



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• QUINN HEAVY DUTY PIPE FORMS
For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.
WRITE TODAY for complete information and estimates.

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Carefree living enhanced by . . . large, cheerful guest rooms . . . private pool, ocean beach, cabana club . . . dining room and cocktail lounge.

Rates from $8 double, European Plan.
Summer & Fall Season

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Overlooking LINCOLN PARK and LAKE MICHIGAN
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A few steps from the Conservatory and Zoo . . . just a few minutes to the Chicago Loop.
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Power in a handy "package!"

Easy to move because it's balanced. Doors of this portable Electric Plant open for operation. Entire weatherproof housing is quickly removable for servicing. Gas tank is underneath for extra safety. Dependable "U.S." unit is D.C. for battery charging or operating portable tools. Available also in A.C. "U.S." builds the world's most complete line. Write for information, briefly stating your requirements.

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For Snow Plows and Road Machinery

SPECIFY **MONARCH CONTROLS** when ordering snow plows

- *Type H.E.P. "Dynamight" Electric Power Control*
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- *Available for 6 or 12 Volt Systems*
- *Fan Belt Driven Models Also Available*

WRITE HYDRAULIC DIVISION
MONARCH ROAD MACH. CO.
322 North Front Ave.
GRAND RAPIDS 4, MICHIGAN

FORD APPOINTED DISTRICT MANAGER. George E. Ford, Decatur, Ga., has been appointed southeastern district manager for Highway Equipment Co., Inc., Cedar Rapids, Ia.

LE ROI NAMES HEUSER SALES VICE-PRESIDENT. Jack E. Heuser, heretofore engine division sales manager, has been appointed vice-president in charge of sales for LeRoi Co., Milwaukee, Wis., a subsidiary of Westinghouse Air Brake. Heuser will be responsible for the organization and management of a newly-created sales division which will sell and service all LeRoi products.

HUDSON PROMOTED BY GOODYEAR. G. A. Hudson, former manager of Farm Tire Sales Department, has been promoted to manager of truck tire sales by Goodyear Tire and Rubber Co., Akron, O. He succeeds H. E. Hoerster who is now a Goodyear dealer.

YUBA RE-ENTERS DREDGE FIELD. Yuba Manufacturing Co., 351 California St., San Francisco 4, Calif., internationally known manufacturer of bucket ladder dredges for nearly 50 years has announced its re-entry into the hydraulic dredge field. Yuba will build hydraulic dredges from 6 in. up, for such diversified uses as harbor construction, and production of sand and gravel. George Pelton, an internationally known mechanical engineer, who has specialized in hydraulic dredging for more than 30 years, will have special responsibility for the company's hydraulic dredging program.

NEW WARCO DISTRIBUTORS. Vermont Road Equipment Co., Inc., Montpelier, Vt., has been appointed Vermont distributor for Warco 4D-85 and 4D-115 motor graders of W. A. Riddell Corp., Bucyrus, O. Nelson Equipment Co., Portland, Ore. has been appointed distributor for Warco motor graders.

JOY ELECTS LAWRENCE EXECUTIVE VICE-PRESIDENT. John Lawrence, heretofore vice-president of manufacturing and engineering of Joy Manufacturing Co., Pittsburgh, Pa., has been elected executive vice-president.

ROEBLING APPOINTS WHITEHALL DISTRICT MANAGER. Edwin F. Whitehall has been named Cleveland district manager by John A. Roebling's Sons Corporation, Trenton, N.J., for the wire rope and cold products division.

BLAW-KNOX TRANSFERS WEIBLEN. Blaw-Knox Co., Pittsburgh, Pa., has transferred Carl F. Weiblen from Pittsburgh to Chicago as sales engineer of its line of clamshell buckets for industrial use.

CATERPILLAR APPOINTMENTS. Appointment of Lee F. Morgan to manager, sales development division, has been announced by W. K. Cox, manager, sales promotion department, Caterpillar Tractor Co., Peoria, Ill. He was promoted from assistant sales manager, Plains division and is succeeded by Louis E. Schumacher.

Servicised Cementone Sponge RUBBER JOINT FILLER

- **Matches Color of Concrete**
- **Fully Resilient . . . Non Extruding**

Servicised Cementone Gray Sponge Rubber Expansion Joint meets the need for an inconspicuous joint filler for architectural concrete. Can be supplied in various degrees of compressibility to meet your requirements. Made in widths to 24" and lengths to 10 ft.

Write for details and the complete Servicised Catalog today. There is no obligation. See SWEET'S Catalog.

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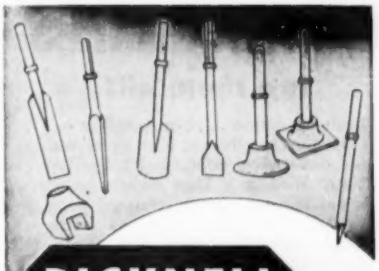

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jobs...

CARAVAN AXLES

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Built for action . . . not coddling . . . CARAVAN axles are job engineered for endurance, safety and long life. Your product is kept on the go at lower cost when it is mounted on a CARAVAN Axle. Built to withstand maximum stress and strain, these axles excel at load stability over rough and difficult terrain. All units in this line feature a massive heavy-duty steering arm, extra-heavy center-arm stop block, heavy-duty steering knuckle and precision ground spindles. All these outstanding features are yours at the most economical price when you specify CARAVAN Axles.

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Little Giant Steps Out

LITTLE GIANT POST DRIVER

Contractor: Wright Contracting Co., Columbus, Georgia. *Project:* West Virginia Turnpike.

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The Little Giant Post Driver is the greatest advancement in post driving history, engineered to meet today's "high speed" Toll Road and Turnpike construction programs. This new rugged attachment is available for the LITTLE GIANT Model "L". Check these features of this versatile machine:

1. Drives wood or steel posts straight and true regardless of road incline, curves or position of truck.
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3. This money-saving machine available for mounting on your truck or as a "complete and ready to operate" rig from factory.
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8. Little Giant also manufactures 1/3, 3/8, and 1/2 yard machines — crawler, truck, barge or rail mounted.

Speed Cuts Costs!

Meet construction deadlines with the Little Giant Post Driver on toll road contracts.

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EAST 16th and HOWARD DRIVE **DES MOINES 13, IOWA**

Modernizing 29 miles of old, narrow highway

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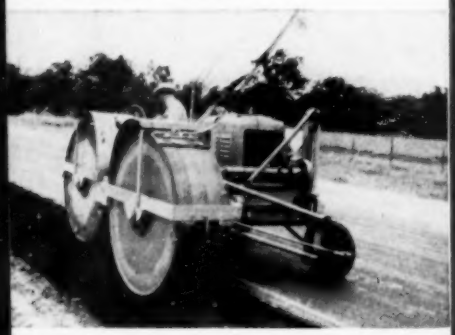
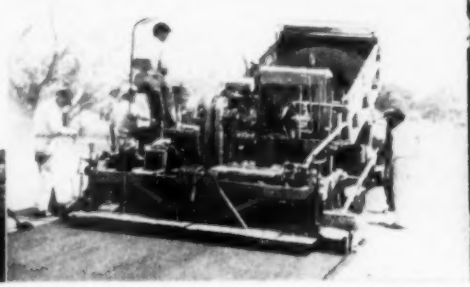


A trench roller was used to compact the four layers of asphaltic concrete laid next to old pavement.

Blade grader spreads one of the two asphalt leveling courses constructed on 29 miles of Texas Route 6.



Putting down the Texaco Asphaltic Concrete wearing surface, bringing total thickness of new asphalt pavement to 5 inches.

View of completed project, except for shoulders. Trucks represent large percentage of highway's 3,000 vehicle a day traffic.

One of the most important recent projects of the Texas State Highway Department called for modernizing 29.7 miles of Route 6 in Brazos and Grimes Counties. The work required the use of 140,000 tons of hot-mix Texaco Asphaltic Concrete.

Two different methods were employed in widening the old 9"x6"x9" concrete pavement. For 19 miles, a 14-inch thickness of asphaltic concrete was added at either side. The other section was widened with 8 inches of crushed stone on a 4-inch sand cushion. The entire mileage was resurfaced with a three-course asphaltic concrete pavement, having a combined thickness of five inches.

An interesting feature was the use of a 135-penetration Texaco asphalt in the asphalt mix for widening, as well as for the two leveling courses of the new pavement A 90-penetration Texaco asphalt went into the wearing surface. These two products, like every other Texaco asphalt cement, cutback asphalt and slow-curing asphaltic oil, are produced from scientifically selected crudes. Into their refining, Texaco puts the experience acquired in supplying asphaltic materials to American road builders from the Atlantic to the Rockies for over half a century.

Helpful information on all types of asphalt construction for streets and highways is supplied in two Texaco booklets, which are yours for the asking, with no obligation.

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